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DIESEL RAILWAY TRACTION

A Supplement illustrating and describing developments in Diesel Railway Traction is presented with each copy of this week's issue.

The Alternative to Planned Economy

AT a time when so many authoritative voices are calling for "planned economy," it is refreshing to hear the opposite. Sir Percy G. Mackinnon, delivering the presidential address last Monday to the Insurance Institute of London, severely criticised the movement for a planned State and a planned economy. The results of this sort of control were to be seen in many countries now and were not encouraging. Sir Percy Mackinnon considered that a central authority had an inherent tendency to resist change, and consequently to pigeon-hole new ideas on the principle of letting well alone (we would call it shirking responsibility). Planning and central control were bad, because they substituted rigidity for elasticity. It is to be hoped Sir Percy Mackinnon's voice will carry far, for the danger is real. Unfortunately he did not elaborate any practical alternative to the planning tendency, and it is open to the planners to retort that, if they have so far failed, the old method certainly did not succeed. We put forward for consideration once again, as the only way out, that it is vitally urgent to create an extended home market by putting the means to purchase into the pockets of the whole of the people. Only by making this proper use of the mechanism of money (the purpose of which is to effect the distribution of goods and services from producer to consumer) can an adequate demand be ensured for the output of industry. It will have to be by way of a non-recoverable subsidy, but given to the ultimate consumer who shall then be free to order what he wants and not what others think may be good for him.

* * * *

Subsidising the Consumer

As illustrative of the difficulties, which at times must be well-nigh overwhelming, facing railway administrators under present conditions, the settling of the various conflicting claims for more income by staff and shareholders may be cited. We reproduce on page 541 the advice of Sir James Milne that mutual forbearance is desirable, since both staff and shareholders derive their remuneration from the same pool. As he points out, the interests of both parties are identical and neither can benefit unless the railways are prosperous. The stubborn fact remains that, despite the loyal and conscientious efforts of the staff, the railways are in a good deal less prosperous state than they were five years ago. This should not be so if internal efficiency regulated general prosperity. As we have often said before, the overall efficiency of British industry, including the transport industry, is, to all appearances, higher to-day than ever before. Despite employing a decreasing proportion of available labour, it is capable of producing goods and services to meet any demand. Every method of stimulating demand has been tried—except that of subsidising the consumer.

* * * *

The Week's Traffics

With the last week's returns the traffic figures of the four group railway companies for three-quarters of the year are now available. For all four companies together the traffics for that period are estimated to aggregate £112,384,000, an increase of £4,759,000 or 4·41 per cent. in comparison with the first 39 weeks of 1933. Passenger train earnings amounted to £51,318,000, a net improvement of £675,000 or 1·33 per cent. As might have been expected, the largest increase both actually and proportionately has been in general merchandise receipts, which are £38,543,500, an advance of £2,739,000 or 7·65 per cent. Coal class earnings reach the figure of £22,522,500, showing an improvement of £1,345,000 or 6·35 per cent.

	39th Week				Inc. or dec.	
	Pass. &c.	Goods, &c.	Coal, &c.	Total.	Year to date	
	£	£	£	£	£	%
L.M.S.R. ..	+ 6,000	+ 14,000	+ 14,000	+ 34,000	+ 1,964,000	+ 4·56
L.N.E.R. ..	+ 6,000	+ 42,000	+ 30,000	+ 78,000	+ 1,899,000	+ 6·09
G.W.R. ..	+ 8,000	− 1,000	+ 15,000	+ 22,000	+ 543,000	+ 2·96
S.R.	+ 13,000	− 1,500	+ 3,500	+ 15,000	+ 353,000	+ 2·34

At this time a year ago the only company showing an increase over the 39 weeks of 1932 was the Southern, with a gain of £64,000. The L.M.S.R. was down £783,000, the L.N.E.R. £638,000 and the Great Western £208,000, but all the companies were at that time rapidly reducing their decreases.

* * * *

Census of Railway Staff

A census of staff employed by the railway companies of Great Britain and on the railway undertakings of the London Passenger Transport Board was issued on Wednesday by the Ministry of Transport. It compares the totals during the week ended March 10, 1934, with those for the week ended March 11, 1933. The total number employed during the 1934 week was 575,048, an increase of 9,108 or 1½ per cent. in comparison with the 1933 week. While the number of male staff advanced from 545,002 to

553,041, the increase in the female staff was from 21,298 to 22,007, though the 1934 figures are less than those for March, 1932, when there were 575,864 male and 22,107 female employees. Of the net increase of 8,039 in the number of male staff employed in March, 1934, as compared with March, 1933, 7,732 was in railway staff and 307 in the staff engaged in ancillary businesses. The fall in the numbers of officers, of supervisory staff, and of clerical staff which has been so noticeable in the past few years is continued, but in the conciliation grades there has been a net increase of 1,157 in numbers, from 321,146 to 322,303. The advance is mainly in goods and cartage staff, which shows an increase in numbers of 3,526, although in the traffic department there are definitely more porters employed and the number of goods guards has increased from 12,892 to 13,301 and the number of goods shunters from 13,847 to 14,086. In the locomotive, carriage and wagon department there are 1,111 more drivers and motormen, and 803 more firemen and assistant motormen, but 2,350 fewer cleaners. The return gives the total salaries and wages paid by the railway companies in the years 1932 and 1933 as £99,847,000 and £96,714,000 respectively.

* * * *

Overseas Railway Traffics

A slight improvement in the Argentine exchange has taken place during the last fortnight, the average rate for the past week being 17·13 pesos to the £ as against 17·16 pesos two weeks earlier. Increases in currency continue to be shown by the four principal Argentine railway companies, except for a slight set-back in this respect in one week on the Buenos Ayres Western. Sterling receipts, on the contrary, still tend for the most part to go down, the largest decrease for the year to date being on the Buenos Ayres Great Southern. The Entre Rios, however, has an increase of £553 for the week. Handsome increases in gross earnings are being continuously recorded by the Canadian Pacific, which for the period January 1 to August 31 has a gain in net earnings of £733,800.

Railway.	No. of Week.	Weekly Traffics.	Increase or Decrease.	Aggregate Traffic.	Increase or Decrease.
		£	£	£	£
Buenos Ayres & Pacific ..	.. 13th	66,959	– 17,827	905,424	– 175,485
Buenos Ayres Great Southern	.. 13th	126,036	– 21,826	1,599,950	– 393,111
Buenos Ayres Western ..	.. 13th	40,864	– 13,741	539,386	– 135,799
Central Argentine ..	.. 13th	110,289	– 14,945	1,629,735	– 137,601
Canadian Pacific	.. 37th	583,600	+ 35,800	17,493,800	+1,818,000
Bombay, Baroda & Central India	25th	152,625	+ 26,400	3,714,450	+ 171,000

* * * *

The Scenic Railway

It is not many years ago that the advertisements of motor car manufacturers were wont to illustrate the transports of those who drove out to some secluded beauty spot and there stopped to admire the view. To-day, beauty spots accessible by road are rarely secluded, and the hypnosis induced by being a unit in a fast moving stream of traffic demands a mental effort to shake it off and come to a standstill of which many are incapable. Love of scenery, however, is by no means extinct, for wherever during the past summer the railways have instituted sight-seeing excursions over routes selected for their scenic interest, these have enjoyed wide popularity. By becoming too heavy for all but the main or arterial highway, road traffic is now forced to ignore many of the attractions to which it was once supposed to be the key. In any case, it is already a novelty for many among the public to be passengers, so that the excursion train offers the rare and beneficial advantage of mental relaxation for its patrons. But to persuade a nation which had grown so road-minded of these facts was not easy, and the success which has attended the efforts of the publicity departments says much for their perseverance and faith.

* * * *

Staff Education in Railway Facilities

The P.O.-Midi Railway of France has issued to its staff a booklet describing all the principal transport facilities offered by the company. This has been prepared under the direction of the General Manager of the P.O.-Midi, M. Henry-Greard, who in a foreword urges the importance of railway propaganda being regarded as one of the duties of every employee, and not as the preserve of the commercial and publicity departments alone. A section of general arguments in favour of rail travel preceding the particularised information also reminds readers that when a query addressed to them falls outside their scope, the onus of referring it to the proper quarter is still theirs. Similar appeals have been addressed to railway servants in this country, but the P.O.-Midi booklet supplies the information necessary in a concise and readable form which is certain to give added impetus to the efficiency with which the principle is put into practice. Many excellent black and white sketches help to fix the subjects dealt with in the reader's mind, and serve a useful purpose by making this very opportune production as cheerful as it is informative.

* * * *

The Winwick Junction Collision

Two bright features emerged from the tale of disaster that followed the serious collision at Winwick Junction on Friday evening last, when, owing to irregular block working by the signalman there, the Euston-Blackpool afternoon express was admitted into a section already occupied by a local passenger train. It was, for instance, a great satisfaction to learn how willingly, promptly and efficiently relief came from a widespread area for the rescue of the passengers and the removal of the injured. The second happy feature was the testimony borne by Sir Samuel Brighouse, the coroner, at the inquest on Tuesday, to the safety of railway travel—" There is no safer place in the world than in a railway train "—and to the fine body of men to whom is committed the care of those who journey by train. It was an intellectual treat, too, to hear so eminent an authority differentiate between errors by carelessness and those, due to the frailty of human nature, made in a moment of forgetfulness. Accidents that are the result of the latter class must, the coroner said, be ascribed to misadventure, and in that view the jury concurred. What, no doubt, helped the man was the frank acknowledgment of his error and his statement, in answer to a question from the jury, that he had not asked for assistance nor did he think any was necessary.

* * * *

Danish State Railways

The Danish State Railways did rather better in the financial year ended March 31, 1934, than in the previous year. This is shown by the final report which substantially confirms the preliminary returns published in The Railway Gazette of May 25. Apart from depreciation and interest on capital there was a loss on working of 5·05 million kroner, which compares with a loss of 13·21 million kroner in 1932-33. Passenger numbers increased from 28·98 millions to 30·69 millions, an advance of 5·9 per cent., and passenger receipts from 43·6 million kroner to 49 million kroner, an improvement of 12·4 per cent. The goods traffic handled rose from 4·60 million metric tons to 4·90 million, an advance of 6·5 per cent., the receipts

showing an improvement of 6·2 per cent. Whereas the increase in full-wagon-load traffic was only 3·9 per cent., the increase in smalls amounted to 13·6 per cent. Capital charges have been cut down as from April 1, 1934, on the recommendations of a committee which also considered the question of depreciation. Railway capital representing expenditure incurred prior to April 1, 1925, has been written down to 100 million kroner. On this reduced figure the railways will have to pay interest at 4½ per cent., which will also be chargeable on any additional capital representing expenditure incurred since 1925. A new method of calculating depreciation has been adopted. It is the General Manager's opinion that he can make the State railways pay their working expenses and these depreciation and interest charges. The present rate of exchange is 22·40 kroner to the £.

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The Reichsbahn at the Stuttgart Exhibition

At the exhibition arranged in connection with the meeting of the German Institution of Electrical Engineers at Stuttgart from July 1 to 25, the Reichsbahn showed a number of electrical appliances, maps and diagrams which awakened much interest among the visitors. Several of the firms concerned assisted with the loan of apparatus in cases where the Stuttgart Divisional Management had no spares at its disposal. About 10,000 persons visited the Reichsbahn stand. An interesting item was a model of the electric high-speed car used in 1901 during the trials on the Marienfelde-Zossen line. The development of electric rolling stock in Germany from the first locomotive of Werner von Siemens in 1879 to the present day was illustrated by a series of photographs. A leading truck of one of the 1-C_0-1 locomotives was shown, with a set of controller apparatus which could be manipulated by the public and another of the automatic acceleration apparatus used on the motor coaches in the Stuttgart local services. There was also a section of overhead line equipment arranged to illustrate the different component parts generally used, supplemented by plans and photographs of the South German power supply systems, and some signalling exhibits. The conducted parties were well patronised and the effort was in keeping with the policy of the Reichsbahn in recent years to neglect no opportunity of making its work known, a policy which has already done much to regain lost traffic.

* * * *

Abolishing Rail Joints

Of the total time occupied in fettling the track a very appreciable proportion is normally devoted to the maintenance of rail joints. A reduction of their number should therefore be followed by a proportionate saving in maintenance expenses. But to this advantage there are others to add, such as economy in bonding, increased life of rails due to less battering of rail ends, reduction in the wear and tear of rolling stock, and, by no means least important, increased travelling comfort. The cost of welding rails end to end by the Thermit process may be 10 to 15 per cent. greater than that of providing ordinary mechanical joints, but it is probable that this expense is more than balanced by the advantages mentioned. A visitor from Sydney recently told us of the smoothness and quietness of running noticeable as soon as trains entered the welded lengths of the New South Wales Government Railways, some notes of whose rail welding practice will be found on page 555. The Victorian Government Railways have also been welding their rail joints for some time past; we published an illustrated article on the subject in our issue of June 23, 1933 (page 839). Germany was the pioneer in this matter, and is now being followed by many other countries. It is significant that the Granet Report on the South African Railways recommends that every second and third joint should be butt-welded.

* * * *

American Rail Production

Rail production in America, according to a recent issue of the *Railway Age*, showed a slight increase in 1933 as compared with 1932, the aggregate tonnage rolled in the United States being 416,296 in the former year, as compared with 402,566 in 1932. There was an increase from 128,522 to 156,787 in the tonnage of rails weighing 120 lb. per yd. and over, but a decrease from 215,091 to 154,007 tons in rails of from 100 to 120 lb. weight, thus showing that the use of very heavy sections on main lines is becoming general. On the other hand, the production of alloy rail steels, for locations in which exceptional wear is sustained, has shrunk to negligible proportions, and in 1933 totalled 437 tons only. An interesting item in the statistics is the re-rolling of worn rails into lighter sections, which increased from a total of 9,488 tons in 1932 to 18,204 tons in 1933, in all cases of less than 60 lb. per yd. But all these figures, of course, are the merest fraction of those current in the heyday of American steel production. From 1918 to 1929 inclusive the total rail production in the U.S.A. never fell below two million tons, and in 1926 it rose to its peak of 3,217,649 tons, which was nearly eight times the 1933 figure. Rail renewals cannot be deferred indefinitely however, and the attempts now being made to overtake arrears of maintenance in America should result in a considerable increase of rail production during 1934.

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Future Railway Traction Methods

Mr. A. I. Lipetz, Consulting Engineer to the American Locomotive Company, who at various times has contributed valuable articles to THE RAILWAY GAZETTE, recently read a paper at a meeting of the Canadian Railway Club entitled "Coming Locomotive Power and Locomotive Research." In summing up, after reviewing the progress of various forms of traction on railways, Mr. Lipetz remarked that among all the innovations which affect the fundamental design of the Stephenson locomotive, apart from high boiler pressures, only the atmospheric-condenser tender and non-condensing turbine locomotive would appear to have some hope for the immediate future. The atmospheric-condensing locomotive is probably not needed, unless for special conditions, but the other type may be required for very high speed long distance trains. It is to be expected that some of the high speed locomotives to be built in the near future will be of the non-condensing turbine type, which has great merits from the point of view of starting, acceleration and balancing. The advantages of long distance and suburban electrification will be partly offered by the turbine locomotive without any great expense. For such duties the use of a streamlined locomotive having the 4-4-4 or 4-6-4 wheel arrangement may be anticipated. This might have the customary form of boiler with steam pressures ranging from 325 to 350 lb. per sq. in. and two comparatively small cylinders outside the frames, to which steam would be distributed by piston or poppet valves, another feature being the use of roller bearings. As an alternative, however, a turbine locomotive would retain the good starting and balancing qualities of four-cylinder reciprocating engines, whilst eliminating the crank axle, to which objection is still taken in America.

South African Railway Commission

WE have now received the full text of the report of the Granet Commission on South African Railways to which reference was made in our issue of September 21, our remarks then being based on a summary supplied by our South African correspondent. The report is a most valuable and interesting document, dealing very thoroughly with important questions of organisation and operation. As we have already shown, the Commission does not recommend any change in the main structure of the organisation of the South African Railways and Harbours, but points out that there are several weak links in the chain of management and suggests remedies. Under existing arrangements, the organisation of the General Manager's office at Johannesburg provides for the General Manager being assisted in his managerial functions by an Assistant General Manager (Technical), an Assistant General Manager (Commercial), and a Superintendent (Special Duties, Parliamentary). The existing arrangements provide that the two Assistant General Managers be of equal status. The divisional system of management is the main feature of the organisation. Under this system the principal functions affecting the work of the railways are grouped and, subject to the control of the General Manager, are placed in the hands of system managers.

One of the weak points in this arrangement is, the Commission considers, that whilst the System Managers look to the Chief Civil Engineer, the Chief Mechanical Engineer, and the Chief Electrical Engineer as the final arbiters under the General Manager, in their respective technical spheres, there are no corresponding heads of departments on whom the System Managers can rely for guidance in connection with the operation of traffic and the separate and equally important matter of commercial activities. The duties of the Assistant General Manager (Commercial) in fact embrace practically all branches of railway business, other than technical and parliamentary questions and, in so far as his supervision covers commercial activities, it must, of necessity be limited to the "indoor" aspects of the matter. The report stresses the importance of having an officer responsible for co-ordinating operating activities throughout the railway, as there are many phases of operation which cannot be dealt with by particular systems on a self-contained basis. It recommends accordingly the appointment at headquarters of a Chief Operating Superintendent, responsible to the General Manager, to co-ordinate the operating activities of the administration. An officer, with similar functions, had already been appointed with the title of Chief Traffic Manager. The Commissioners approve this appointment but consider the title they have suggested to be more suitable, as that of Chief Traffic Manager suggests a combination of operating and commercial functions. Appointment at headquarters is also recommended of a Chief Commercial Superintendent responsible to the General Manager, this officer to co-ordinate the commercial activities of the administration. Consequent on these recommendations the report favours the abolition of the positions of Assistant General Manager (Technical) and Assistant General Manager (Commercial). It also recommends the appointment of a Deputy General Manager, who will function as general assistant and, with the exception of matters of high policy, act on behalf of the General Manager in his absence. One of the reasons for this suggestion is that, the legislative capital being at Cape Town, the General Manager has to be stationed there during the Parliamentary Session which sometimes lasts over five months, and has, in consequence, to be absent during that period from his office in Johannesburg. Appreciative reference is made in the report to the benefits, both in efficiency and economy, achieved by different departments as the direct result of scientific research work, but it is suggested that the best results are to be obtained by a definite research organisation. The appointment of a research officer is therefore recommended, part of whose functions should be: (*a*) to discover and define the problems into which research is desirable, (*b*) to provide means for carrying out scientific research on railway problems, (*c*) to act as scientific consultant to the various departments, and (*d*) to keep the departments in touch with outside scientific and technical developments relative to their activities. Dealing with another form of research, the report calls attention to the importance of analyses of detailed operations.

On the subject of economies, the report speaks appreciatively of the effective manner in which a very difficult situation was dealt with, but at the same time makes the pertinent criticism on the reduction of the number of supervisory officers that such measures, while showing a saving in the cost of supervision, have a tendency to defeat the object in view by increasing to a much greater extent expenditure in other directions, and also to decrease efficiency generally. The training of technical officers and the standards required for engineering pupils receives special attention in the report itself and in an individual memorandum by Herr Meyer. Overseas visits by officers are also strongly recommended; they should be systematic and frequent and of sufficient duration to enable the officers concerned to make a thorough investigation of the subjects entrusted to them.

Many suggestions of great value are made in the report and in a special memorandum by Herr Meyer as to improvements in connection with the permanent way. Changes in the internal organisation of each workshop are also recommended, to which brief reference was made in our issue of September 21. The Commission did not, as might have been assumed from our summarised report, definitely reject the suggestion of a Railway Rates Tribunal, but pointed out that—with the exception of the Canadian National Railways—there was no State-owned railway in the world where a dissatisfied party had the right to appeal to an impartial outside tribunal. This was recorded as a finding of fact and not as evidence that the demand for a right of appeal against rates was unreasonable. At the same time, the Commission considers that an independent tribunal would be unable, in present circumstances, to afford any relief to the railway user beyond that of giving him the opportunity of stating his case publicly. Again, the Commission did not unreservedly favour the employment of European unskilled labour on the railways, but expressed the opinion that, provided the number of such labourers was kept within reasonable bounds, and the character of the work for which they were employed was strictly defined, their employment was not uneconomic.

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One Hundred Miles an Hour

THERE is probably no realm of transport in which the maximum speed of travel is subject to such wild exaggeration as the railway. From the early days of railway operation speed "records" have been as plentiful as blackberries in the autumn; but critical examination generally proves that the supposed record has no foundation in actual fact. Some of these claims have their humorous side. The writer of a popular book on American railways, recently published, after referring to the legendary feat of No. 999 of the New York Central, which in 1893 is credited with having covered a mile at 112·5 m.p.h., went on to remark that "within the decade following this run records of one hundred miles

an hour or better were made on the New York Central, the Michigan Central, the Pennsylvania, and the Burlington. Two are recorded as beating the time of No. 999—a burst of speed of 4·8 miles at the rate of 115·2 miles an hour on the Philadelphia and Reading "—obviously 4·8 miles in 2½ min.—" made near Atlantic City, and a five-mile run from Fleming into Jacksonville, Florida, on the old Plant system, now the Atlantic Coast line. This run, the fastest of all recorded, was made in March, 1901, at the finish of a race for a contract to haul the Florida mail. The Plant system's train, delayed by a hot box on its regular engine, was brought into Jacksonville to win the race by an engine commandeered from a passing freight train, which ran the last five miles in two-and-a-half minutes—120 miles an hour." We are not told whether this feat included slowing down to the dead stop, or if the train then took to the Atlantic to swim to the West Indies.

Record speeds on the roads, on racing tracks, and in the air are established as records only when a number of competent observers have jointly timed the performances with the most accurate of apparatus; but the most casual of observations, timed over some short distance to no smaller unit than the nearest minute, have often sufficed to produce a claim that a railway locomotive has travelled at a hundred miles an hour or more. With many new types of express locomotive produced in this country of recent years, we have been told that they will certainly travel at a hundred miles an hour without difficulty, as if such speeds were even called for by present-day schedules. And yet it is open to doubt if any *authentic* record exists as yet of a steam locomotive having hauled a train at a speed of 100 m.p.h. or more. Correspondence now proceeding in the columns of our monthly contemporary *The Railway Magazine* has, with reasoned arguments based on the figures available, raised considerable doubt as to whether the record figure of 102·3 m.p.h., supposed to have been reached by a British locomotive in 1904, was, in fact, attained. The only railway train which does regularly attain the 100 m.p.h. mark is the Flying Hamburger, of the German State Railway, but this, of course, is streamlined and is propelled by diesel engines and not by steam. It is not without interest in this connection that details of specimen regular runs by the Flying Hamburger are to be found in our *Diesel Railway Traction Supplement* this week. Another diesel-electric streamlined train which recently put up a remarkable performance is the Burlington Zephyr, which as we describe on another page of this issue, on June 15 covered a distance of 1,015 miles non-stop in 13 hr. 5 min., attaining a maximum speed of 112·5 m.p.h.

The latest 100 m.p.h. speed claim with steam hails again from America. Recently the Chicago, Milwaukee, St. Paul & Pacific Railroad has speeded up its service between Chicago and Milwaukee, bringing the time between the two cities, 85 miles apart, down to 90 min. by the best trains. Before the inauguration of the accelerated service, a trial run was made with a five-coach train weighing 365 long (2,240 lb.) tons, hauled by a 292-ton 4-6-4 locomotive on which, we are told, "all steam locomotive records for speed, maintained over a distance of fifty miles or more, were broken." The details of this run are given on page 554 of this issue, but they establish the fact that, owing to cautious running necessary in the vicinity of both Chicago and Milwaukee, the start-to-stop speed of the test journey did not break the record at present held by the Great Western Railway of this country. On June 6, 1932, the Cheltenham Flyer was run from Swindon to Paddington, as checked with the closest accuracy by a number of observers, at a start-to-stop speed of 81·68 m.p.h., whereas the start-to-stop speed of the C.M.St.P. & P. test was only 75·46 m.p.h. But over the 68·74 miles from Mayfair, Illinois, to Lake, Wisconsin, the American train achieved a time of 45 min. 53 sec., which gives an average of 89·89 m.p.h., comparing favourably with the Great Western average of 87·5 m.p.h. over the 70 miles between mileposts 72 and 2 on the 1932 run. Whereas the maximum speed attained on the G.W. run was 92·3 m.p.h., recorded with split-second chronometers over ½-mile distances, however, the American run claims 103·5 m.p.h., read from a speedometer. The point-to-point averages in the latter case certainly indicate very high speeds, including an average of 97·0 m.p.h. over one stretch of 3·34 miles, and it is unfortunate that there is nothing more reliable than a speedometer reading to authenticate whether or not the 100 m.p.h. level really was crossed by a steam locomotive on this occasion.

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Locomotive Experimental Stations

WHEN the question is being considered of setting up such a plant as a locomotive testing and experimental station, and the cost appears at first glance prohibitive, the point to be kept clearly in mind is that of the ultimate savings capable of being effected by means of the installation, together with other and highly important considerations of scientific value. The subject thus has a distinct commercial as well as scientific importance, and for this reason we were glad to notice that in his Presidential Address to the Institution of Locomotive Engineers on September 27, reported on page 551, Mr. H. N. Gresley insisted particularly upon this point. By quoting the amount spent annually by the railways of this country on locomotive fuel, and estimating what might be saved in this direction by applying the lessons learned at the testing station, he showed that a percentage economy which would equal the amount involved in laying down and equipping the plant might confidently be expected.

It is calculated that the initial cost of establishment would, as in the case of the Vitry plant in France, described in our last issue, be in the neighbourhood of £120,000, and, since the British railways spend £12,000,000 on coal for locomotives annually, even if one per cent. saving in coal consumption were achieved as a result of researches carried out at the testing station, this would suffice, in a single year, to cover the expenditure. At the present time, however, whereas abroad, and particularly in America, France and Germany, high-powered and fully equipped locomotive testing plants have been installed and valuable lessons learned therefrom, this country can point only to one small installation of 500 h.p. capacity, namely, that established at the Swindon works of the Great Western Railway some thirty years ago by the late Mr. Churchward, to whom Mr. Gresley paid a generous tribute, gracefully acknowledged by the present Chief Mechanical Engineer of the L.M.S.R., who formerly served under Mr. Churchward. The Swindon plant is naturally inadequate for present day needs, and the four almost obsolete dynamometer cars possessed by the British railways cannot properly compensate for the lack of a really up to date stationary plant. The railways of this country do not stand alone to gain by the use of testing equipment. It would, as was pointed out by Mr. Gresley, be of the highest value to the Dominion and Colonial railways, whilst the locomotive building industry would also be in a more advantageous position in having facilities for experimental research. We therefore consider the subject of Mr. Gresley's address to have been most opportunely chosen. If a national locomotive experimental station is eventually instituted in this country, it will be largely to his efforts that the credit will be due.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Travel with a Holiday Season

6, Bedford Terrace,
Joppa, Midlothian.
September 28

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I was much amused by the remarks of "Veritas" in to-day's issue of THE RAILWAY GAZETTE concerning the photograph of myself.

My own intensive travels pale somewhat beside those of many drivers, guards, &c., who go thousands of miles each month, and every month. Here, for example, is the log of the journeys made by my friend Driver T. Dron, of Gateshead, who is seen in the photograph with me. This particular log covers the month August 6, 1934, to September 5, and I have no doubt that it by no means represents a record monthly distance for Mr. Dron or many other drivers.

	miles
Newcastle—London (268½ miles), Aug. 6, 8, 10, 12 ..	1,074
London—Newcastle (268½ miles), Aug. 7, 9, 11	805½
London—Edinburgh (392½ miles), Aug. 13, 23, 31	1,177½
Edinburgh—London (392½ miles), Aug. 22, 30	785
Edinburgh—Newcastle (124½ miles) Aug. 14, 24, Sept. 1 ..	373½
Newcastle—Edinburgh (124½ miles) Aug. 21, 29	249
Newcastle—Edinburgh and back (249 miles), Aug. 20, 25, Sept. 3, 4, 5, ...	1,245
Newcastle—Leeds and back (210 miles), Aug. 15, 16, 17, 18, 27, 28	1,260
Total	6,969½

These distances do not, of course, include trips to and from sheds, &c.

I have just passed my 5,000th mile on my push-bike after 155 days on the machine, so that you will see that my travels are not confined to the railway.

Yours, etc.,
CECIL M. FURST

P.S.—Sorry that I cannot provide "Veritas" with a photo of myself "about to pass," "passing," or "just having passed," the 5,000th mile.

The Dining Car Menu

United University Club,
Pall Mall East, S.W.1.
October 1

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Referring to your correspondence on this subject, may I suggest that food is not the only thing that matters? In very hot weather the question of drinks may be of equal or even greater importance.

In an English dining car the passenger is expected to order some bottled drink at a fancy price; if he does not, the staff regard him with contempt. If he has sufficient courage to ask for a glass of water they will grudgingly bring it, but when it arrives it is sure to be tepid and quite undrinkable. Many and many a time have I come away from an English dining car miserably thirsty.

On the other hand, during the past summer I have travelled several thousand miles by rail in Canada. The cost of a dining car meal is nominally about the same in Canada as in England, but at every meal in the Canadian car the passenger is supplied with an unlimited quantity of cold water—it is really most refreshing to hear the lumps of ice clinking in the glass—and as much tea or coffee as he cares to drink. This is included in the price of the meal and the passenger is not expected to order anything else. And after such a meal one may quote approvingly "to-night fate cannot touch me; I have dined."

The English practice is a survival from the time when dining cars were introduced in the last century, when caterers generally relied for their profit on the sale of alcoholic liquors and nothing else was supposed to matter. But drinking habits have changed, and the conditions to-day are really different though the railway companies seem unaware of the fact.

Yours, etc.,
W. B. THOMPSON

[Surely Mr. Thompson's experience cannot be very general. Many a time have we drunk nothing but water on a dining car in this country, but never have we noticed the contempt to which Mr. Thompson alludes. Perhaps we are too thick-skinned? We like the idea of plenty of tea or *coffee* (our italics), and we like best of all the hint about ice.—ED. *R.G.*]

The First Railway "Bed-Carriage"

Tisbury, Wilts.
September 29

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The first edition of Arthur Freeling's Grand Junction Railway Companion is dated 1837 on the title page. The general regulations of the company are given, in which it is stated that "the first class trains will consist of coaches carrying six inside, and of mails carrying four inside, one compartment of which is convertible into a bed carriage, if required." The fares are given "From Liverpool or Manchester to Birmingham, or *vice versa*," which include:—

	£	s.	d.
First-class coach, six inside	1	1	0
Mail coach, four inside	1	5	0
Bed carriage in mail coach	2	0	0

This, I think, makes it practically certain that bed-carriages ran as soon as the railway was opened.

Your obedient servant,
REGINALD B. FELLOWS

Alleged Belgian Iron and Steel Cartel

16, Finsbury Square, E.C.2.
October 1

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—We have been asked by the Société Anonyme des Usines et Boulonneries de Mariemont, Haine-St.-Pierre, Belgium, for whom we act as sole agents in this country, to categorically deny the truth of certain press statements which have recently appeared here conveying the impression that the output of their works is in any way controlled by a cartel. They emphasise that

(*a*) the Société de Mariemont is a totally independent concern; its capital, management and works are under its own individual direction;
(*b*) any information tending to suggest the contrary is inaccurate.

It is true, they add, that recently conversations have taken place with a view to the formation of such a cartel, but the Société de Mariemont has refused to participate in any such arrangement as being detrimental to the interests of its clients.

Yours faithfully,
H. J. SKELTON & CO. LTD.,
J. W. CHICK,
Secretary

A NEW G.W.R. NEWSPAPER TRAIN.—A new newspaper express to South Wales was introduced last Monday. It leaves Paddington at 1.20 a.m., and the first stop is at Newport, 133·4 miles booked in 137 min. at an average speed of 58·4 m.p.h. Cardiff is reached at 3.59 a.m. and Swansea at 5.44 a.m., and the London morning newspapers will be distributed over all parts of South Wales by breakfast time. As compared with the previous 1 a.m. train, the new service gives an acceleration of about 45 min. The schedule to Newport is 4 min. quicker than that of the best passenger express, and 10 min. quicker than the fastest booking in the up direction.

PUBLICATIONS RECEIVED

Appointments and Careers for Graduates and Students. 1934. London: Commerce Degree Bureau and Appointments Board, University of London, 46, Russell Square, W.C.1. 8½ in. × 5½ in. Pp. 174. Price 1s. net.—Up-to-date information on the means of entry into all careers likely to be considered by the university graduate, together with an outline of the work involved and the essential qualifications, is provided by this useful handbook, now in a third and considerably expanded edition. It is fully indexed, and guidance in questions outside the scope of its pages will be found in an appended bibliography of careers literature and a list of the addresses of various bodies offering possible openings or assistance to applicants for situations. Readers are also referred to the standard reference books and directories of the industries and professions dealt with.

The New Survey of London Life and Labour, Volume Eight—London Industries III. London, 1934: P. S. King & Son, Ltd., Orchard House, Westminster, S.W.1. 8¾ in. × 5½ in. × 1¼ in. 323 pp. and folding map. Price 17s. 6d.—The New Survey of London Life and Labour was undertaken in 1928 by the London School of Economics and Political Science, which, besides using for the purpose part of the income from an endowment given to the school by the Laura Spelman Rockefeller Foundation Memorial and part of the Ratan Tata Research Fund, received direct gifts from the City Parochial Charities Trustees, the Carnegie United Kingdom Trustees, the Noel Buxton Trustees, the Halley Stewart Trustees, and the Fishmongers', Drapers', Clothworkers' and Goldsmiths' Companies. The Survey has been conducted under the direction of Sir Hubert Llewellyn Smith, G.C.B., and the results are being published in nine volumes, of which the present is the eighth. The first, entitled "Forty Years of Change," consisted of an estimate of the degree of social and economic change that had taken place since Charles Booth's great work of about 40 years ago. The second volume comprised the first series of studies of London Industries, namely, building and works of construction, the engineering and metal trades, furnishing and woodworking, clothing and shoe trades, domestic service, and dock labour. Volume III (with IV, the companion volume of maps) was in the main a study of social conditions in the eastern sector of the survey area, and in particular of the proportion borne by poverty to well-being; studies of unemployment and poverty, old age and poverty, over-crowding, the homeless poor, the street trading community, and the hop-pickers' migration. The fifth volume contained the second instalment of studies of London industries, covering those concerned with the manufacture of food, drink and tobacco, wholesale food markets, and all branches of retail distributive trade, together with the chemical and allied industries, the printing and bookbinding, leather and fur trades, laundry work, and water-borne transport.

Volume VI (with VII, its companion volume of maps) completed the study of social conditions by giving particulars for the western sector in similar detail to those shown in Volume III for the eastern sector, and presented the results for the survey area as a whole. It also contained special studies on the London housing problem, migration of population, Jewish life and labour in East London, household economy and cookery in relation to poverty, and mental deficiency in relation to poverty.

The present volume—VIII—is the third and last of the industrial series, and completes the New Survey of London Industries in so far as has been found practicable within the compass of the available time, space, and resources. As in the preceding volumes, the general plan adopted for each industry has been to show its comparative size and its growth or decline, or change of methods and organisation since the time of Charles Booth's survey. Particular attention has been given to matters which directly affect the life and labour of the people of London who are employed in industry, such as mechanisation, working conditions, trade organisation, employment of women and juveniles, hours of labour, wages and earnings, unemployment, and recruitment and training. The industries covered are (1) transport by road and rail; (2) certain essential services such as electricity, gas and water supply, hotel, restaurant and catering services; (3) clerical work; (4) a group of highly interesting and characteristic London industries concerned with the working of precious metals and jewellery and the manufacture of clocks and watches and scientific and musical instruments. The chapters dealing with transport by road and rail provide many striking contrasts as the result of changes both within the transport industry and also in other industries of which, in a mechanical age, transport is the life blood. Of the whole number of 25,000 adult railway workers in the County of London in 1891, only 4,100, or one in six, belonged to a trade union. The unions were not recognised by the principal companies, and no machinery as yet existed for collective bargaining and conditions of employment. The tendency to widen the circle of dormitory suburbs is reflected by the fact that to make adequate comparison with conditions of 1891, a "greater London" area has been taken, as otherwise figures for the old central area would show deceptive decreases by reason of workers living further from their place of employment than formerly. Over this period of 40 years there was a five-fold expansion of tramway traffic (199 millions to 1,057 millions) and a twelvefold expansion of omnibus traffic (159 millions to 1,912 millions). Since the war, the proportion of drivers and conductors employed on buses and trams, respectively, has altered from 6 : 2 to 6 : 5. In view of the obvious care with which the survey has been conducted, it is regrettable that certain easily avoidable errors should have crept in. Thus it is stated "in 1915 all the London Underground electric railways, except the Metropolitan . . . came under the control of the Underground Electric Railways Company." This control had become effective some three years earlier, and the only change in 1915 was the passing of the "Facilities" Act for pooling receipts. Again it is stated that "in 1921 the number of separate main line railway companies was reduced from 9 to 4." While the Railways Act was passed in 1921, staff and other changes with which the volume is concerned date from 1923, when actual grouping was effected.

Outstanding among the many interesting facts which emerge from a perusal of the Survey is that the forces of change at work are combining to shift the main centre of interest of a worker's life from his work to his leisure. Whether that leisure be the margin of time available for recreation after the day's work is done, or the compulsory leisure imposed by total or partial unemployment, its use provides the great and growing interest in relation to life and labour, not only in London but throughout the world. A result of increasing mechanisation is referred to in our second editorial note on page 529, and we are promised that the ninth and final volume of the New Survey will deal with the problems associated with leisure pursuits.

Chisel Steels.—Alloy and carbon steels for pneumatic and hand chisels are described in a folder which we have received from Edgar Allen & Co. Ltd., Imperial Steel Works, Sheffield, 9. The hard wearing qualities of these materials are strikingly exemplified by illustrations of tools after long periods of severe service. Stag air-hardening high speed steel and Minerva chisel steel are listed for pneumatic tools, and the Maxmith, Maxchip and £ s. d. grades for hand work.

Edgar Allen Publications.—The latest edition of the "Edgar Allen Steel Foundry Book" has been rearranged in sectional form. Each of the nine sections is a separate pamphlet, but a spring-backed binder is supplied to hold the complete set, which then forms a full treatise on the subject, with the additional advantage of being readily brought up to date as revised pages are issued. Following particulars of steel castings for most engineering purposes are chapters dealing with heat treatment and steel foundry welding. We have also received an illustrated folder describing the Stag series of files and rasps.

THE SCRAP HEAP

An African visiting Liverpool said to a friend on Saturday:—"It took us not long to arrive from London. Your trains are so much."—*From the "Liverpool Post."*

* * *

46-YEARS RAILWAY SERVICE WITHOUT A DAY'S ILLNESS

As recorded in the account of Mr. Arthurton's career on page 549, since he joined the Great Western railway service in 1888 he has never been absent a day through illness.

* * *

The strongest man in the world is to appear in London. It is said that when he wants to open a railway carriage window he just does it.—*From "Punch."*

* * *

An ex-railwayman was applying for a position as waiter at an hotel. When asked if he had had any previous experience he replied: "Yes, 15 years as a plate-layer."

* * *

Lady (to man friend): "Had a wonderful experience the other day. Went from King's Cross to Edinburgh without stopping. Had lunch and—to let you into a little secret—a glass of wine, a nice long nap, a hair wave, tea, and a mild flirtation, all in 7½ hours. Splendid, wasn't it?"

Man friend: "Pooh, that's nothing. Last Friday night I went from Victoria to Brighton non-stop. Had a snack, two cocktails, three beers and a brace of double whiskies. Played nap with Smith and finished up 15s. 6d. to the good. All in *one* hour. That's what *I* call sport."

A RAILWAY DANCE RHYTHM

We reproduce an invitation, unfortunately received too late for us to avail ourselves of it, to attend a demonstration of a new dance known as the six-four, inspired, we understand, by the passage of wheels over rail joints. After importing rhythms for so long which have been derived from various manifestations of the transatlantic temperament, it is satisfactory to find the railway featuring as a characteristic of British life worthy of perpetuation in the dance (or danse).

* * *

We reproduce below a photograph of a page of Bradshaw's Railway Guide for December, 1845, showing the stop of one minute only of the Exeter Express at Swindon. In the following month—January, 1846—the company was compelled to resume the ten minutes stop which had been discontinued from May 12. The Courts decided "that a breach of the covenant contained in the lease of December 18, 1841, had been committed by the company and that the express trains between London and Exeter were not 'trains sent express or for special purposes' within the exception in the lease." The lessees of the refreshment rooms therefore won their case and succeeded in compelling the company to stop all ordinary passenger trains at Swindon, so that passengers might obtain refreshments. The company had argued that since, under the terms of the lease which had been granted to the caterers who held the refreshment rooms, "trains sent express or for special purposes" need not be stopped, the Exeter Expresses came under that heading, but against the company it was decided that the words applied only to what we should now term "special trains." Eventually, in 1895, the company bought up the lease and took over the refreshment rooms at a cost of about £100,000, and that autumn some ordinary expresses were booked to "pass" Swindon.

When the G.W.R. put on a fast train to and from Exeter on March 10, 1845, it was described as a "Quick train" for which special fares were charged, but when, two months later, the stop at Swindon was reduced from ten minutes to one minute and the train was retimed to leave Paddington at 9.45 a.m. instead of 10.15 a.m., the word "Express" was used instead of "Quick" in the printed references to the fares, and also as a description of the train in the time table. This was of course in support of the company's contention before the Courts, already referred to.

* * *

Lisandro Pereira was 19, in love, and penniless. How could he visit his sweetheart? To walk to Pua from Santiago was too much to expect even a 19-year-old lover to do. So he stole a railway engine! The furnace roared, the pistons raced, the engine thundered, Pereira's sweetheart every moment was brought nearer. But the course of true love, even when it is a railway track, does not run smooth. Pereira could not stop the engine; it crashed into the buffers; and Pereira stepped from the wreckage into the arms—of the law.—*From "The Daily Herald."*

Presentation of the Dance Steps arranged for the new British Rhythm

THE SIX-FOUR

by Maurice Vert, who requests the pleasure of

Railway Publications *'s company*

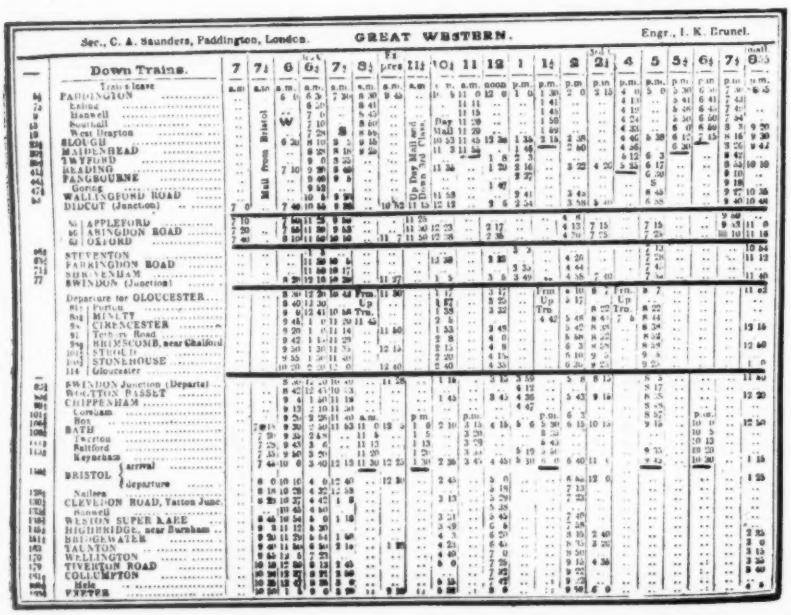
on Wednesday, October 3rd at 12 noon

At The Carlton Danse Salon,

Tottenham Court Road, London, W.

Tommy de Rosa and his Band

By courtesy of the Management


Sec., C. A. Saunders, Paddington, London. GREAT WESTERN. Engr., I. K. Brunel.

Down Trains.

PADDINGTON dep.
Ealing
Hanwell
Southall
West Drayton
SLOUGH
MAIDENHEAD
TWYFORD
READING
FARINGDON
Goring
WALLINGFORD ROAD
DIDCOT (Junction)
APPLEFORD
ABINGDON ROAD
OXFORD
STEVENTON
FARRINGDON ROAD
SHRIVENHAM
SWINDON (Junction)
Departure for GLOUCESTER
PURTON
MINETTY
CIRENCESTER
TETBURY ROAD
BRIMSCOMB, near Chalford
STROUD
STONEHOUSE
Gloucester
SWINDON Junction (Depart)
BECKETTS BASSET
CHIPPENHAM
Corsham
Box
BATH
Twerton
Saltford
Keynsham
BRISTOL arrival
BRISTOL departure
Nailsea
CLEVEDON ROAD, Yatton Junc.
Banwell
WESTON SUPER MARE
HIGHBRIDGE, near Burnham
BRIDGWATER
TAUNTON
WELLINGTON
TIVERTON ROAD
COLLUMPTON
EXETER

A page of Bradshaw's Railway Guide for December, 1845, showing the stop of one minute only of the Exeter express at Swindon

OVERSEAS RAILWAY AFFAIRS

(*From our special correspondents*)

Argentine diesel railcars and tenders restrictions—Indian Railway Conference session—Spanish level crossing decree—New Zealand main line locomotives—São Paulo railways policy—Non-stop passing loop in Victoria—Norwegian developments

ARGENTINA

Diesel Traction Trials on B.A.W.

For some time past the Buenos Ayres Western Railway has had under consideration the use of diesel electric traction for passenger service on certain of its lines, and experiments are at present being carried out with different types of diesel-electric railcars, in order to determine the most suitable class of vehicle. The first of these is a 450 h.p. diesel-electric articulated set, built by Sir W. G. Armstrong Whitworth & Co. Ltd. It embodies the latest equipment and improvements, with comfortable accommodation for 50 passengers. The Armstrong-Sulzer engine has sufficient reserve power to handle additional coaches coupled to the unit, without appreciably reducing the speed. A 140 b.h.p. Armstrong-Saurer railcar has also been delivered.

Exchange Control and the Quotation of Tenders in Foreign Currency

A decree of interest to foreign firms tendering for contracts for Argentine public works, has just been issued by the Argentine Government. It prohibits the State Railways, the National Oilfields, National Sanitary Works and other Government departments from accepting contracts stipulating the granting of the necessary exchange by the Exchange Control Bureau. The decree orders that when calling for tenders for materials or articles which are produced both in Argentina and abroad, the price of these must be quoted in paper pesos and payment made in the same currency. Articles or materials of foreign origin, which are not produced locally, may be quoted in foreign currency and payment made in the same medium; but under no circumstances may payment be stipulated in gold, gold coin or similar terms, without the express authorisation of the Ministry of Finance. The Ministry of Finance must also authorise the insertion in calls for tenders of clauses providing for the payment in Argentine paper pesos of the equivalent of a certain sum in foreign currency, and clauses making the amount to be paid in pesos subject to the fluctuations in exchange.

Purchases of foreign articles must be submitted to the Ministry of Finance, indicating the class of goods, the country of origin, the date of payment and the probable amount in foreign currency. If the prospects of the exchange market and the regulations in force permit, the Ministry of Finance will instruct the Exchange Control Bureau to issue to the order of the National Treasury or the department concerned, an advance permit for making the remittance as soon as the goods have been received. This permit will be liquidated through the Bank of the Nation at the average rate for the preceding day.

Argentine Harvest Statistics, 1933-34

The second official estimate of the Argentine wheat harvest for 1933-34 indicates that this year's crop is the highest yet registered, with the exception of 1928-29. Compared with the December estimate, the wheat crop shows an increase of 815,000 tons, being 1,231,000 tons higher than in 1932-33, while the quality is described as good. On the other hand, the figures for both linseed and oats are lower than those of last year, but barley shows an improvement of 84,000 tons. The following table gives the estimated production in tons of the four crops, as compared with that of last year:—

	1933-34 (Tons)	1932-33 (Tons)
Wheat ..	7,787,000	6,556,000
Linseed ..	1,440,000	1,575,037
Oats ..	833,000	1,010,000
Barley ..	784,000	700,000

INDIA

Hardinge Bridge Inquiry

A committee, consisting of experienced Government and railway engineers, has been appointed by the Government of India to inquire and report whether further works are required to ensure the safety of the Hardinge Bridge. It will be recalled that Sir Robert Gales, on the invitation of the Government of India, inspected the bridge during the last cold weather and drew up a plan of protective works. The most urgent of these works, which were described in THE RAILWAY GAZETTE of August 3 last, have been carried out, and the committee is asked to report whether in view of the action of the river during the present monsoon it is necessary to carry out all the works recommended by Sir Robert. The committee's report will be forwarded to Sir Robert Gales for a final opinion.

[A reassuring press note issued by the Chief Engineer, E.B.R., about the bridge was published on page 362 in THE RAILWAY GAZETTE of August 31.—ED.—*R.G.*]

Railway Conference Association

The Indian Railway Conference Association will hold its 31st session at Simla from October 6 to 13 under the Presidency of Mr. J. Williamson, Agent, Bengal & North Western and Rohilkund & Kumaon Railways; it will be attended by about 70 officers representing the majority of the railways in India. Among the more important subjects to be discussed are the reports of the various sections of the association; the revision of the fundamental rules of the association which have been drafted in connection with measures for a general speeding up of the association's business; a report on the question of the cost of operation of light trains which has been the subject of investigation during the past 12 months by a special committee; the best methods to be adopted by railways to safeguard their interests as affected by road transport competition, which subject has also been reported upon by a special committee; wagon supplies for broad gauge railways and the report on the working of the broad gauge wagon pool during 1933-34 by the General Secretary of the association who is also Director of Wagon Interchange on Broad Gauge Railways. The conference will also consider the recommendations of a special committee appointed to determine the statistics which will require to be obtained as a preliminary to the revision of the goods classification on Indian railways: this is the first step in a matter which has engaged the attention of the I.R.C.A. for some years but on which definite action necessarily had to be postponed during the trade depression of recent times.

Wheat Freights Reduced

The failure of the wheat crops in the United States has enabled India to participate in the world trade in wheat. To encourage further export, the North Western Railway has agreed to reduce the freight on export wheat railed from the Punjab to Karachi.

SPAIN

Level Crossings

The *Madrid Gazette* publishes a Decree of the Ministry of Public Works, approved by the Council of Ministers, ordering the reinstatement, within eight days, of crossing keepers and gates or barriers at all level crossings on main roads with motor traffic and lack of visibility.

Level crossings gates and keepers (mostly wives of platelayers) were abolished at a large number of

crossings under the Royal Decree of June 22, 1928, and were replaced by fixed warning signals at an adequate distance on the road. At the same time, it was widely advertised that drivers of vehicles would in future bear the onus of seeing that the track was clear before crossing the line. The number of accidents has shown that the motorist still invariably tries to beat the engine to the crossing; when he fails the railway company is blamed for the accident. Statistics formulated by the Northern of Spain Company were published in THE RAILWAY GAZETTE of March 23, and clearly show the position on that system. The irrefutable conclusion was that at guarded crossings there were more than double the number of accidents at permanently open crossings protected only by caution signs.

Classification and Protection now Ordered

The new Decree provides for the classification of all the existing level crossings in four classes, according to the importance of the road, Class A relating to crossings in or near towns, B the crossings on main roads, C those on side roads, and D lanes on which motor traffic is infrequent and slow. Classes A and B crossings are to have barriers worked from signal boxes or manually, and luminous intermittent signals on the road at each approach. Class C crossings may continue without the protection of barriers in any case where there is a clear view from a point in the centre of the road 15 m. from the nearest rail, over a length of 600 m. in each direction along the railway. This applies only to lines where maximum speeds of under 70 km.p.h. are allowed, and the distance must be 800 m. for lines where speeds are 70 km.p.h. and over. In all cases the barriers must be placed at 15 m. from the nearest rail, to allow of a vehicle being turned. In this class, the gates or barriers may be replaced by approved moving, audible and light signals actuated by the train itself through a track circuit. Class D crossings are allowed to continue without any gate protections, but a warning notice must be prominently displayed in a convenient position on the road, and in this case, as in all others, "whistle" notices are required on the railway. All crossings in the vicinity of towns, and all those in charge of crossing keepers, are to be furnished with telephones.

Cost of New Crossings

In future railway or road constructions or extensions, no level crossings will be permitted. As regards existing lines, the cost of abolition of level crossings and their substitution by bridges or deviations is to be chargeable to the railways and to the State or local authority responsible for the road, the railway company being responsible for the proportion equivalent to the amount of the capitalised value at 5 per cent. of the cost, on the present basis, of maintaining the crossing during the years that remain of the concession.

Unreasonable Demands

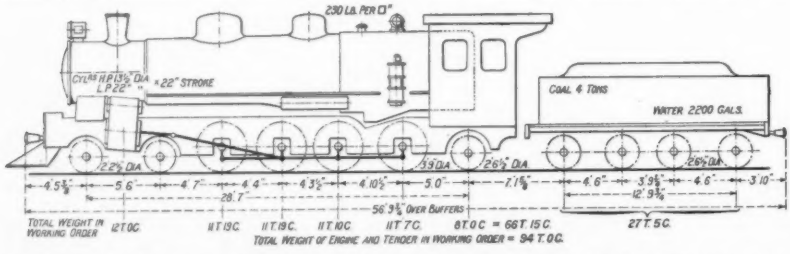
It is very hard that after the motor vehicles have deprived the railways of the cream of their traffic, the companies should be called upon to spend great sums in installing safety appliances to protect motorists. It is impossible, within the short space of eight days, to train the necessary personnel to man such a large number of gates, and to provide the necessary appliances. Apart from this, there is the complicated question of housing the additional staff, as level crossing keepers are entitled to the eight hour day. As a rule, in country districts there is only one cottage available. This difficulty, indeed, was one of the reasons which led to the removal of the barriers and staff in 1928.

NEW ZEALAND

Locomotives on North Island Main Line

The engineering and scenic features of the North Island main trunk line of the New Zealand Government Railways were described in THE RAILWAY GAZETTE of September 14, and there follow some notes upon the locomotives operating over this severely graded 426-mile route connecting Wellington and Auckland. Prior to the recent introduction of the "K" class 4-8-4 type of locomotive (see THE RAILWAY GAZETTE of December 15, 1933), passenger trains were generally worked by the "A b" (4-8-2) class. Though powerful for their date (1908) these engines latterly became barely equal to the task imposed. They are 4-cylinder compounds with the high pressure cylinders between the frames. The leading dimensions are shown on the diagram. It may be recalled that the "K" class locomotives, which are superseding them, weigh 84 tons (exclusive of the 51-ton tender), have two 20 in. by 26 in. cylinders, 4 ft. 6 in. coupled wheels, and a boiler pressure of 200 lb. per sq. in.

The heaviest goods duties are allotted to the "X" class Garratts, though these are supplemented by the "A b's" for goods working also. These Garratts, fully described in THE RAILWAY GAZETTE of December 14, 1928, are of the 4-6-2 + 2-6-4 type and were supplied by Beyer, Peacock & Co. Ltd. at the end of 1928. They have six cylinders each 16½ in. by 24 in., 4 ft. 9 in. coupled wheels, 200 lb. boiler pressure, and weigh 146 tons in working order. They can negotiate a 3-chain curve and attain 50 m.p.h. The gears of the centre cylinders are actuated by the Gresley patent intermediate lever arrangement. Some are fitted with mechanical stokers and the fireboxes are each fitted with two Nicholson thermic syphons.



Four-cylinder compound "A b" class locomotive, New Zealand Railways

(See also illustration on page 548)

BRAZIL

The Federal Interventor for the State of São Paulo Reviews the Railway Situation

In the course of a speech at Ribeirão Preto, Dr. Armando de Salles Oliveira, the Federal Interventor for the State of São Paulo, alluded to various features of the railway situation. He said that as long ago as 1904 the idea was formulated by Dr. Alfredo Maia (then Minister of Communications) that the Paulista and Mogyana Railways should be fused into one concern, and afterwards absorb the Sorocabana, thus completing the unification of the three large railway systems of the State. But owing to differences of opinion between the administrations of the Paulista and Mogyana Companies regarding the evaluation of their respective shares, the fusion scheme was abandoned.

The three systems concerned were at that time in a situation of approximate equality; the sum total of their external obligations, little more than £6,000,000, represented roughly 100,000 contos in national currency, and the shouldering of this burden would have been more than balanced by the advantages of grouping. Even the pessimists could not have foreseen the exchange *débâcle* which has since become so serious. Among the potential advantages of such a fusion may be mentioned a more favourable rating system and a saving of capital expenditure on various unnecessary and non-lucrative constructions which have since been carried out.

Present Position in São Paulo

Discussing the present unsatisfactory situation, the Federal Interventor excepted the São Paulo Company, which

had done well in spite of the crisis and exchange difficulties, largely as a result of its sober policy. Reserve funds were adequate to compensate for declines in receipts at the present time; the major portion of the large traffic handled was carried at remunerative rates, which, until recent legislation stepped in, underwent variations proportionate to exchange fluctuations. In consequence of past profits and confidence in the future, the S.P.R. was extremely anxious to have its contract renewed, and proposed to devote the sum of £6 million sterling towards extensive improvements, asking only for permission to raise its rates in order to produce a small return on the capital expended.

The Paulista and Mogyana Railways

Turning to the Paulista, which forms an extension of the São Paulo Railway from Jundiahy into the interior of the State, Dr. Oliveira reminded his hearers that in order to uphold its excellent financial position, an annual net revenue of over 30,000 contos is required, so that the slightest deviation to other routes of the traffic at present handed over by one of its great feeders (the S.P.R.) would be bound to have disastrous consequences.

As regards the Mogyana, in spite of the opening of numerous extensions and additional branch lines, this company could not only have supported its monetary burdens but even have earned a fair return on its capital but for the collapse in exchange. For the external loans negotiated in 1911 and 1914, amounting to £4 million sterling, the company received 56,000 contos, whereas to redeem this capital sum in full at the present time would require approximately 240,000 contos.

Absorption of Small Railways

As to the smaller railways in the State, everything was tending towards their subsequent incorporation in the trunk lines which they fed, on account of their precarious financial situation and small hopes of improvement.

Beginning in the year 1924, a marked increase in goods traffic imported through Santos was registered, and this caused such congestion on the Serra lines of the São Paulo Railway, that an immediate study of the question became imperative. After consultations, the way seemed clear for an understanding between the Government of São Paulo and the São Paulo Railway, or, in the case of failure to come to terms, for the taking-over of the British system by the State. Instead of this, however, sundry schemes for the construction of alternative routes between the interior of the State and Santos were studied, that from Mayrink on the Sorocabana being finally adopted.

For the traffic congestion that had by now assumed such serious proportions, the São Paulo Railway's method of operating trains by cable up and down the Serra was in great part responsible, and the company had come to the conclusion that only by the conversion of the cable system to rack-working, involving a capital outlay of approximately £800,000, could this congestion be alleviated.

Instead, however, of following up these studies, the State Government insisted on the construction of the new line from Mayrink, upon which 220,000 contos had already been spent, a total which would soon become 400,000 contos, with the completion of the work not even in sight, and the import traffic problem no nearer solution.

Financial Position of the Sorocabana

In order to ascertain the exact financial condition of the Sorocabana—the railway which, in consequence of this Mayrink-Santos construction, is proving such a burden to the State treasury—the Interventor had a statement prepared of the entire capital account of the railway since its acquisition by the State of São Paulo in 1905.

The total capital on December 31, 1933, including simple interest at the rate of 8 per cent. per annum, amounted to 1,062,053 contos; deducting 321,072 contos, which represented the net receipts from 1905 to 1933 inclusive, the real value of the Sorocabana's capital was 740,981 contos. This sum, although alarmingly high, is not really the final figure. To it must be added the amount that is still to be spent on finishing off the construction of the Mayrink-Santos line, including the additional equipment urgently required, so that within about three years the total sum will be in the region of a million contos.

The argument that it was justifiable for the Government to be blind to the urgency of earning sufficient to remunerate the capital sunk in a State railway of the importance of the Sorocabana, on the grounds that the cost of operation would be amply compensated for by an increase in gross takings resulting from the development of fresh areas of production, was acceptable within certain limits, but unfortunately these limits had already been exceeded, and it was not right to expect greater sacrifices from the State.

The Government's Policy

The Interventor concluded by saying that his intention was to tackle the railway problem of the State of São Paulo with the utmost discretion; so far he had taken no definite steps beyond the agreement drawn up between the State Government and the Paulista Railway for the financing of the comprehensive improvements scheme on the E.F. Noroéste. By thus associating itself with a private company for the purpose of assisting a Federal line, the São Paulo State Government wished to exemplify its policy of general co-operation, without which it would be impossible satisfactorily to solve the complex problem.

VICTORIA

A Unique Running Crossing

Two fast passenger trains are now daily executing a non-stop crossing at Werribee under single-line working conditions, which is claimed to be the only crossing of its kind in the Southern Hemisphere. The 5.0 p.m. up Geelong Flier and the 5.5 p.m. down Warrnambool train are scheduled to reach the cross-over at either end of No. 2 road at Werribee at 5.35 p.m. The Flier proceeds through No. 1 road, while the down train is passing along No. 2 road (more than one mile in length) the crossing of the trains being thus effected without delay to either train.

The following safeguards are in force: Before passing over the motor-operated points at either end of the section, each train must obtain "proceed" from an arrival signal. Prior to reaching the departure signal at the other end, the down train must obtain "proceed" at two intermediate signals, and the up train at three intermediate signals. The movements of the down and up trains are, therefore, controlled by four and five signals respectively. This running crossing was introduced on April 9 last when the first of the State-wide train accelerations came into force. It has proved an important factor in enabling the afternoon Melbourne-Warrnambool train to leave Spencer Street 20 minutes later than previously and run to a schedule similar to that of the Flier.

NORWAY

Electrification and New Works

The long-promised electrification of the Ostfold Railway is about to be undertaken between Oslo and Ski, along with an extension of the electrified lines in the Drammen district between Kongsberg and Hjuksebo and from Notodden to Borgestad; the latter is part of the Bratsberg Railway. The conversion of these lines, scheduled to be completed in 1936, will add 97 km. to the electrified mileage of the State Railways. Hakavik power station near Oslo, is to be enlarged to supply the extra energy required, and at the same time the line between Ljan and Ski is to be doubled. The Vestfold Railway is to be converted from narrow to standard gauge. It is estimated that the cost of the above programme will amount to 24,170,000 kr., split up as follows:—

	kr.
Electrification, Kongsberg–Hjuksebo	1,668,000
,, Notodden–Borgestod	2,190,000
,, Oslo-Ski	2,720,000
Enlarging Hakavik power station ...	420,000
Doubling Ljan-Ski line	4,480,000
Converting Vestfold line to standard gauge	12,170,000

In July last the 32-mile line from Grong, the terminus of the Northern railway to Namsos, on the coast, was opened to traffic.

IMPROVED SPARK ARRESTER, NEW ZEALAND RAILWAYS

This new pattern arrester, after proving efficient where others had failed, is now in general use in the North Island, and ensures the safe use of soft lignite coal in the driest weather

THE new smokebox arrangement recently developed for use with soft lignite coals on the New Zealand Government Railways, has proved so effective in preventing the emission of sparks and cinders from locomotive chimneys, that it has been found possible to use local Waikato coal all the year round in the North Island, instead of having to import hard bituminous coal from the South Island for use in the summer months. Formerly the ordinary type of spark arrester, formed of netting, allowed such quantities of Waikato coal cinders to be thrown from chimneys that the danger of line-side fires was great, a danger accentuated in dry weather especially where timber bridges were in use. The name Waikato has been given to the new arrester after the coal for which it is primarily intended.

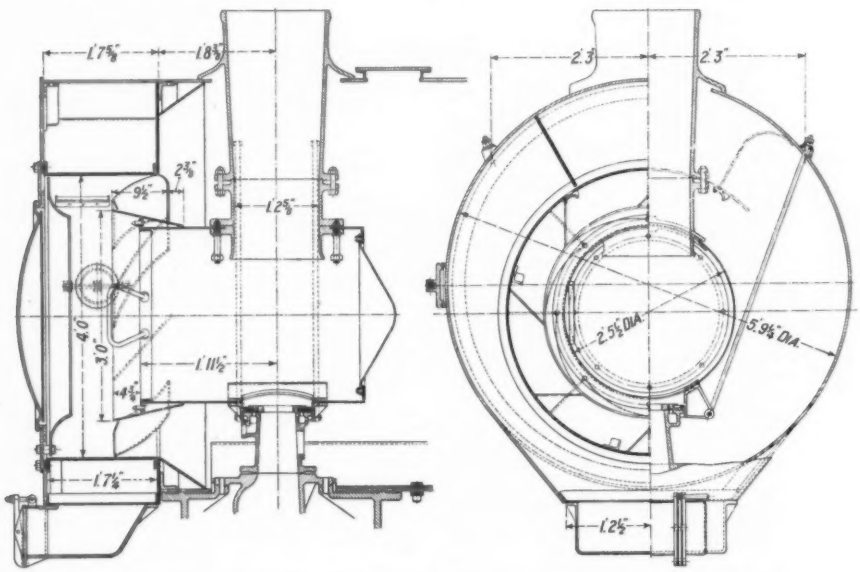


Fig. 1. Waikato spark arresting device as fitted to a "K" class 4-8-4 locomotive, with annular hopper for collecting the ashes

The Waikato Arrester Described

Fig. 1 shows the arrangement of the device as fitted to the latest K class locomotives. It consists of a drum located in the smokebox, the back end of which is closed; openings are provided at the top and bottom for connection to the chimney petticoat and to the top of the blast pipe. On the outer surface of the drum at the front end a number of helical blades are provided which fit into a chamber in the front of the smokebox. At the top of this chamber and immediately in front of the helical blades, two openings with diverting vanes are provided, these communicating with an annular hopper located around the chamber which forms a receptacle for sparks and ash. A hinged door is fitted at the lower part of the hopper to allow of ashes being removed at sheds.

In operation, the flue gases are drawn through the annular space between the drum and the smokebox proper, and on passing through the helical blades are given a rotating motion resulting in all sparks and solid particles being thrown outwards against the walls of the front chamber. There they are intercepted by the diverting vanes and passed into the ash hopper through the openings provided. The interior of the smokebox is thus automatically kept perfectly clean and free from ash, and only in the event of the hopper becoming filled are cinders thrown dead from the chimney, the smokebox still remaining clean.

The Older Arrester without Hopper

The first batch of Waikato spark arresters made were not provided with the hopper for catching ashes, but were made as shown by Fig. 2. In this design all the ash is ejected from the chimney, but the sparks are so thoroughly ground up by being whirled against the walls of the smokebox that they are extinguished before emission. It was, however, found that, especially with soft coal, the amount of cinder thrown out was a nuisance both to the engine crew and on account of the ash accumulating in and about the cars of passenger trains, and it was for this reason that the cinder intercepting device and ash hopper were provided. All further engines are being fitted with this modified arrangement.

Application to Mechanically-stoked Garratts

Cinder elimination is of particular benefit where large

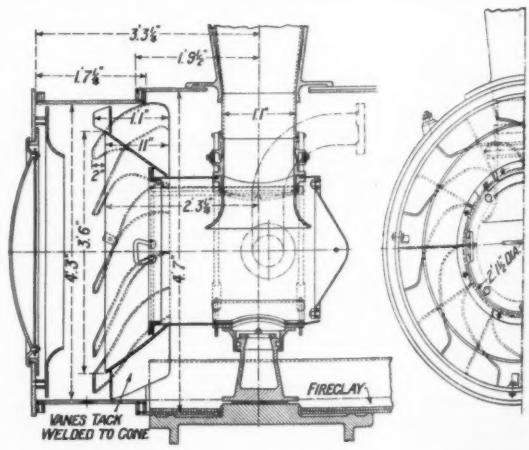


Fig. 2. The earlier type of Waikato arrester without hopper, as fitted to an "Ab" (4-8-2) class locomotive

engines are concerned, as with the usual form of netting spark arrester, engines such as the "K" class or the Garratt engines, having mechanical stokers, were found to be very dirty when burning New Zealand soft coal. Owing to the extreme friability of both the hard and soft varieties of coal in the Dominion, the fuel is broken up quite small by the mechanical stokers, a large amount of it going on to the fire almost in the form of pulverised fuel. This resulted in so much ash being ejected from the chimney that it was inadvisable to use these engines on passenger trains. Fig. 3 shows the Waikato spark arrester as fitted to a Garratt locomotive, and this addition has resulted in eliminating completely the ejection of ash.

Easy Withdrawal of the Whole Arrester

It will be noticed that provision is made for easy removal of the drum from the smokebox to give access to such parts as tubes, elements, steam pipes, &c., and for washing out purposes. To remove the drum it is only necessary to slack back the four nuts outside the smokebox which support the rods attached to the baseplate under the drum, remove the cotters at the front and the two set pins at the chimney joint and the drum can then be pulled out through the smokebox door, thus quickly giving access to the interior. This is an important feature of the design from the point of view of the shed staff, as it facilitates repairs in the smokebox, and it eliminates netting and the trouble of frequent cleaning to insure the free steaming of the engine. Engines fitted with the Waikato front-end have proved themselves free steamers, especially on soft and inferior coal, and the elimination of spark and cinder emission from the chimney has been found to be completely effective.

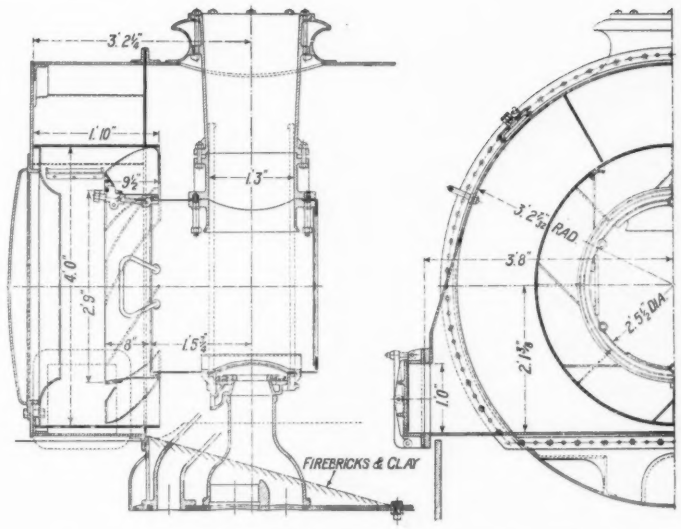


Fig. 3. Special form of Waikato arrester designed for the N.Z.G.R. Garratt locomotives

The arrangement is the subject of patents in several countries, the agents for the patentees being A. C. Gillies and Laird Limited, Rouths' Building, Featherston Street, Wellington, C.1., New Zealand.

Practically all the North Island locomotives are being equipped with this front-end arrangement, the work of installation being done as they pass through shops for overhaul; in addition engines in the Dunedin and Invercargill section of the South Island will also be equipped, as there is a large amount of soft fuel available in this locality, the coal being also of a very similar nature to the Waikato variety of the North Island.

Sir James Milne on Wages and Dividends

As a hint to the staff and shareholders, Sir James Milne, General Manager of the Great Western Railway, in the October issue of *The Great Western Railway Magazine*, writes:—

A partial restoration of the deductions from salaries and wages which have been in operation since March, 1931, will take effect this month. On the part of the railway management this action was influenced by the hope that the revival in trade which has recently taken place will be continued, and that railway traffics will progressively improve. They feel confident that they may rely as heretofore on the fullest co-operation of the staff of all grades in their efforts to make the services offered by the railway companies so advantageous and attractive to traders and passengers as to command the greatest possible return.

It must be recognised that, notwithstanding the desire of the companies to do all they can for the benefit of the staff, the moderate improvement in their revenues which they have lately enjoyed is inadequate in itself to justify any general increase in salaries and wages at the present time. The increase in the gross receipts during the current year still leaves them at a figure many millions below the sum at which they stood when the deductions were originally made, and it must be borne in mind that even this increase is not all profit; it has required increased expenditure to earn it.

There has been some criticism in the public press by shareholders that any general advance in salaries and wages should be given at this time; and there have been retorts by representatives of the interests of the staff. This is to be regretted. The interests of both parties are fundamentally identical: neither can benefit unless the railways are prosperous. It would be unwise of the staff to ignore the shareholders' interests, because the maintenance of railway progress and railway employment depends upon renewed supplies of capital, which can only be obtained if the public believe in railways as a reasonable investment for their money. It would be equally imprudent if the shareholders were to ignore the benefits of having a staff which is assured that it is getting fair and reasonable treatment.

On the present occasion the companies may have gone beyond the realities of the moment and drawn a draft upon the future. At this time of reviving confidence it may, however, be hoped that their action will be justified by recognition on the part of the staff that the companies have done their utmost to keep alive and foster the goodwill which to-day characterises the relations between all parties on the railways.

[An editorial note will be found on page 529.]

AUTOMATIC SIGNALLING OF A HEAVY MAIN LINE GRADIENT

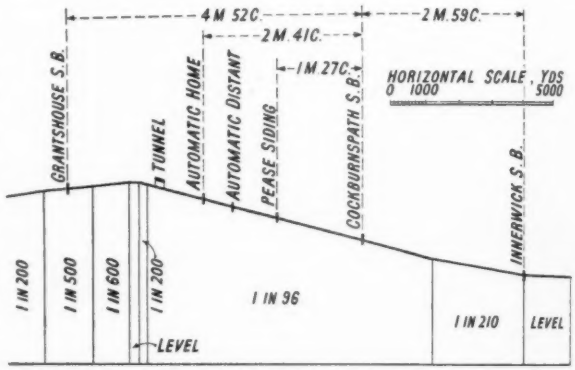
A scheme to assist in maintaining an even flow of traffic despite the slower speed of trains up the Cockburnspath bank, L.N.E.R.

THE Edinburgh to Berwick section of the East Coast main line crosses the Lammermuir Hills at Penmanshiels, a point lying between Cockburnspath and Grantshouse stations, 36½ and 41¼ miles respectively from Edinburgh. The gradients are shown on the accompanying diagram. The up line attains its summit by negotiating the northern slope of the hills, the final portion terminating in a rising gradient of 1 in 96 for a distance of 7,900 yds., of which length 5,900 yds. lie between the signal boxes at the stations named. The actual distance from box to box is 4 m. 52 ch. and that long section, coupled with the severe gradients, has seriously limited the capacity of the line. It was no uncommon event for trains to be stalled on the bank and to necessitate a banking engine to be sent to their assistance. Not only was that an expense and a delay, but the delays reacted adversely on following trains. In order to eliminate those delays—and, incidentally, to reduce the headway between trains—the up line section has been divided by the installation of automatic colour light signals of the searchlight type, together with continuous track circuit between the starting signal at Cockburnspath and the inner home signal at Grantshouse.

The signals were supplied by the General Railway Signal Company, and are of the d.c. permanent magnet type, with 6 volt mechanisms and 4 volt 3 watt lamps. The latter are fed from primary batteries and are approach lighted. To provide for a lamp failure each signal is furnished, as seen in the diagram, with an auxiliary lamp on the right of the post, which is switched in should the filament in the main signal fail; the auxiliary light in the stop signal would, in that event, exhibit "red." A telephone is fixed at that signal so that trainmen can, in an emergency, communicate with the signal box in advance—Grantshouse.

The starting signal at Cockburnspath can be lowered only if the track circuit is clear to the overlap of the automatic stop signal and if, also, the latter signal has gone to "danger" behind the previous train. Should the signal, however, have remained irregularly at "clear" the Cockburnspath starting signal control cannot be released unless the track circuits are unoccupied up to Grantshouse inner home signal and the inner home, outer home and, consequently, also the distant at that box are "on." Track circuit indicators have been provided in Cockburnspath box to show the condition of the track from the starting signal to the overlap of the stop signal. The box at Grantshouse has a similar indication as to the track from the stop signal to the inner home signal there; also the separate indication at the outer home signal to enable the man to work to rule 39 (a) as to not lowering that signal, should the next stop signal be at "danger," until the train is close to the signal.

The grasping of the catch-handle of the lever of the starting signal at Cockburnspath momentarily lights up the two automatic signals and, as they have light indicators in that box, the signalman is assured that the lamp



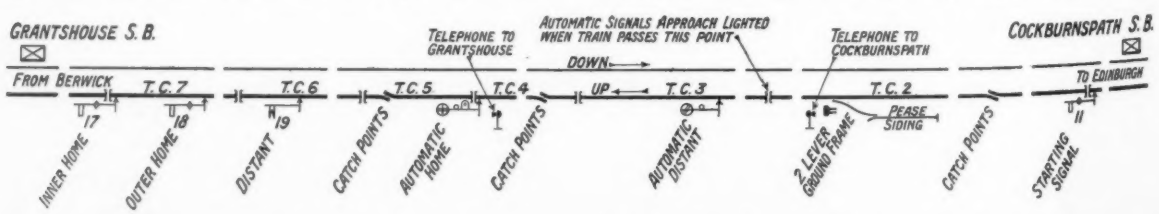
Gradient profile of the Cockburnspath bank on the L.N.E.R. main line between Berwick and Edinburgh

filaments are intact. This arrangement has the further great advantage that the man can hold back a train at his starting signal in preference to allowing it to come to a stand at the automatic stop signal, where any difficulty in restarting would be more acute.

Block-working between the two boxes concerned has been abolished as regards normal working, but it is introduced when either or both boxes are switched out. When Cockburnspath is working with a box ahead of Grantshouse, the Cockburnspath starting signal lever is released by the receipt of the *line clear* current on the block, and when Grantshouse is working with a box in the rear of Cockburnspath the block indicator is held at *train on line* by the track circuit at Grantshouse outer home signal.

Our diagram shows an intermediate siding—Pease siding—with a connection with the up line 1 m. 27 ch. east of Cockburnspath. This is operated by a two-lever ground frame, electrically controlled from that box. Telephonic communication is provided between the signal box and the ground frame.

The installation was carried out by the Signal and Telegraph Section of the Engineer's Department (Scotland)



Track circuit and automatic signalling diagram of the up line from Cockburnspath to Grantshouse

and has been in operation since August, 1933. The results have been entirely satisfactory, both from the operating and maintenance points of view. As regards the latter, the primary batteries, of 500 a.h., have, due to approach lighting, successfully maintained the lighting of the signals for a period of over twelve months without attention or renewal; whilst in the same time only one lamp has had to be replaced. It is proposed to equip these signals with double filament lamps, and so render the retention of the auxiliary lights unnecessary.

Following the success of this installation the L.N.E.R. has proceeded with an additional six installations—three purely automatic and three semi-automatic—in the Scottish Area. These are being installed, under contract, by the Westinghouse Brake & Saxby Signal Co. to the requirements of the Superintendent, Mr. C. H. Stemp, and the instructions of the Engineer, Mr. W. A. Fraser, the work being under the supervision of Mr. A. Moss, the Signal & Telegraph Assistant to the Engineer. The new installations are at Ferryhills, Philpstoun, and Gogar.

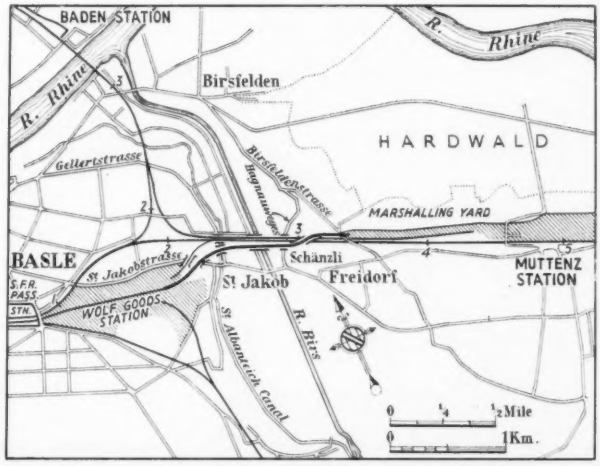
NEW MARSHALLING YARD NEAR BASLE, SWISS FEDERAL RAILWAYS

View of part of the Muttenz yard, Basle, showing on left wagons descending the hump

NEARLY four years ago the Swiss Federal Railways opened a large marshalling yard at Muttenz, just outside Basle, which was designed to facilitate the goods working at that place and to enable certain movements to be concentrated there which were formerly carried out at other stations. Before the formation of the Swiss Federal Railways as a unified undertaking, the various company-owned lines possessed yards of their own, but the work was often carried on in them with little regard to the convenience of adjoining systems. Some of the yards, too, were not large enough to cope with the traffic and considerable delay was frequently experienced. This method of working was naturally very uneconomical and the Federal Railways management determined, before the war, to improve the situation by constructing a new yard at the most convenient spot. This was considered to be Basle, the principal gateway to Switzerland, where a number of important main routes from other countries converge, such as those of the Alsace-Lorraine and Baden lines, and thence lead on to Olten, Berne, Lucerne, Lausanne and beyond.

Stations at Basle

The principal passenger station at Basle is that of the Swiss Federal Railways. The German Reichsbahn also has a station in Swiss territory, with a connecting line to that of the S.F.R. The Swiss station was opened in 1906. There is also the Wolf marshalling yard, which dates from 1874 and has been several times enlarged, and the St. Johann and Kleinhüningen goods stations, connecting with quays on the Rhine. As traffic was freed from other yards it increased at Basle and the provision of better facilities became imperative. The Wolf station could not be extended, and it was therefore decided to build an entirely new one between the Birs river and Pratteln, alongside Muttenz station. The traffic here is



Sketch map showing position of Muttenz marshalling yard

No. 4 cabin, showing rail-brakes and sorting sidings

mainly through west to east and east to west, but there is a certain amount of it which arrives from, say, the west and has to be sent away again in the same direction. After due consideration of all the requirements it was decided to arrange the new yard as a double one, the southern half serving the traffic from Germany into Switzerland and the northern half that proceeding the reverse way. This made the layout rather extensive, but it was well suited to deal with the work and, as there is a great deal of transit traffic from foreign systems necessitating customs and other formalities, it was considered preferable to err, if at all, on the side of providing more facilities than were absolutely essential under normal conditions. This arrangement of the two yards allows for right hand running of trains, although in Switzerland the reverse practice is followed. At the time it was chosen there was considerable discussion as to whether a change in this respect ought not to be made, and the working on the Alsace-Lorraine and Baden lines was, of course, already right handed. The war led to the Alsace-Lorraine

Interior of hump cabin, showing special control frame. On left pneumatic dispatch apparatus

Electric point machine with cover removed, and point indicator

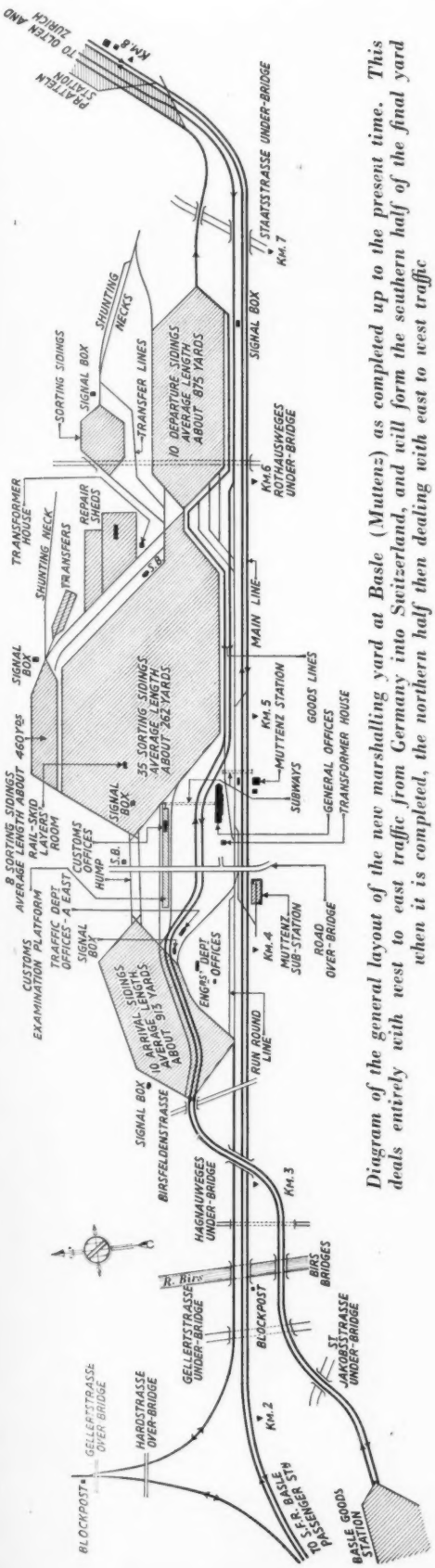


Diagram of the general layout of the new marshalling yard at Basle (Muttenz) as completed up to the present time. This deals entirely with west to east traffic from Germany into Switzerland, and will form the southern half of the final yard when it is completed, the northern half then dealing with east to west traffic

line becoming French, with some chance of a reversal, and all idea of changing in Switzerland was finally abandoned. It was agreed, however, not to alter the plans of the yard on that account.

Construction Started

The work was begun partly with the intention of providing alleviation in the unemployment situation in 1922, but only the southern half of the yard, serving west to east traffic, has been built as yet. The traffic in the opposite direction is still dealt with at the Wolf yard. The south yard is constructed on the hump principle, as will be eventually the north yard, with two humps of different heights for summer and winter service. The reception section of the yard is more extensive than is usually the case, a certain reservoir for wagons being essential at a frontier station. The wagons pass as usual from this portion of the yard to the marshalling sidings via the hump, and the track layout is such that trains can leave them directly in the direction of Pratteln. The upper group of lines in the sidings is for vehicles which are not going through to the east. There are also special customs examination lines and lines for wagons of which the ultimate destination has not been settled by the time they arrive.

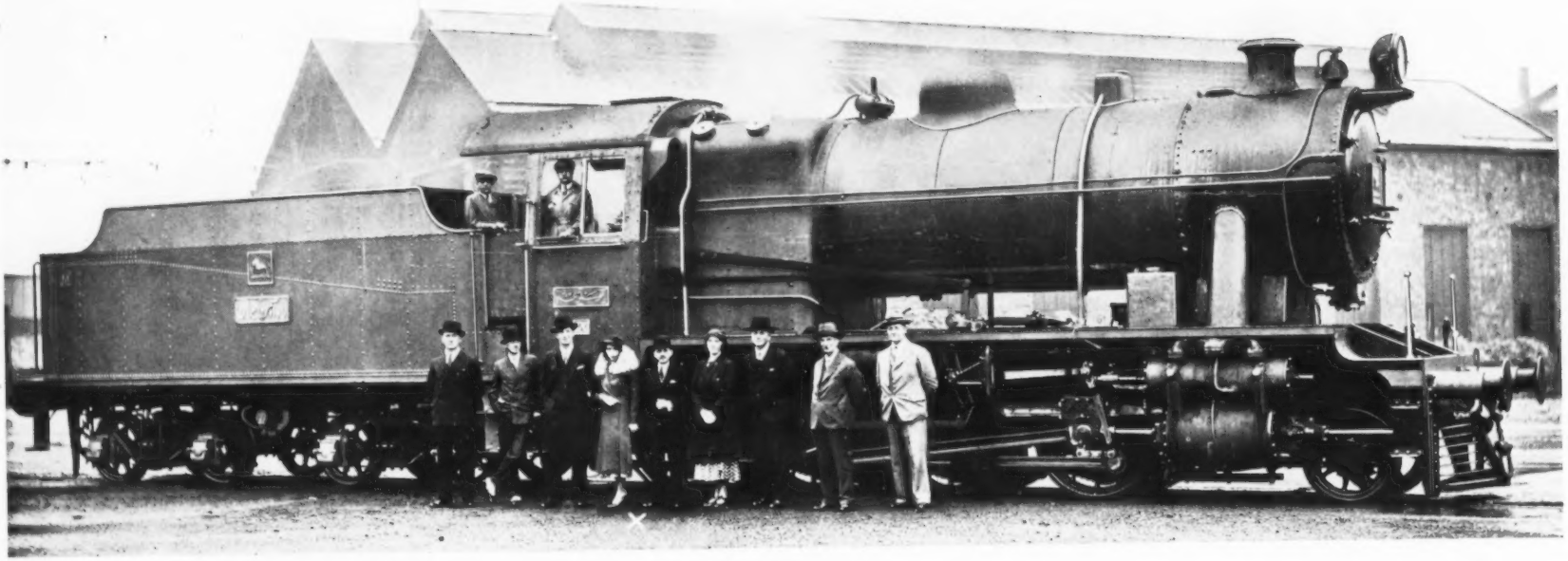
Connections with Running Lines

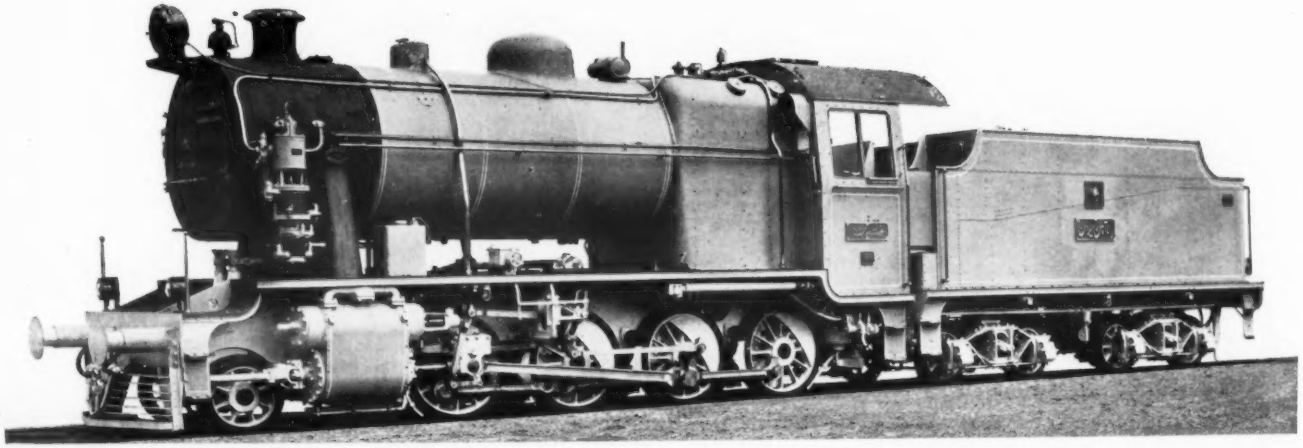
The connections with the running lines had to be planned with great care to minimise interference with ordinary train movements, and with this object in view, a number of flyover junctions were constructed and certain lines re-arranged to give more convenient connections. An entirely new line has been built to connect the Wolf yard with the new Muttenz yard, passing over the main passenger lines and the connecting line to the Baden station. The construction of this line necessitated the building of a number of important bridges over the Birs River and various roadways. This additional facility was brought into use in November, 1932, in the early part of which year some extensions at the eastern end of the yard were opened for traffic.

Equipment of the Yard

The signalling and point working is on the all-electric system, and there are several cabins already at work. The principal pairs of points leading from the hump lines to the group of sorting sidings are fitted with A.E.G. rapid acting point machines controlled from a desk pattern frame in the hump cabin. Frölich hydraulic rail-brakes are also operated from this cabin. In case of emergency, certain points can be worked from a special reserve cabin situated at the hump itself. The hump cabin apparatus is of the magazine storage system, in which the necessary controls are stored up in advance before shunting begins. Track circuits at the points, worked by the descending wagons, govern the release of the controls in turn. Pneumatic tube apparatus is provided between the hump, the cabin and the yardmen to enable marshalling sheets and other instructions to be exchanged as rapidly as possible. Electric motors of the Siemens and Halske type are used for points which are not required to be rapid acting, and similar apparatus controls the semaphore signals. Signals leading to and from the main line are controlled by the lock-and-block system generally used in Switzerland. The movements over the hump are directed by means of a three-colour light signal, supplemented by electric hooters for use in foggy weather.

The cost of the complete scheme as estimated according to the plans prepared in 1918, was 37 million Swiss francs, but this figure will probably have to be increased by 13 millions on account of the rise in prices and certain improvements and extensions not at first included.





New 2-8-0 mixed traffic locomotive for the Persian Government Railways. Above is a group taken when H.E. The Persian Minister, with his wife (indicated by an X) visited the works of the builders, Beyer, Peacock & Co. Ltd., at Manchester

FIRST BRITISH-BUILT LOCOMOTIVE FOR PERSIA

BRITISH-BUILT 2-8-0 LOCOMOTIVES FOR PERSIA

The first order for locomotives placed in Great Britain by the Persian Government has just been completed by Beyer, Peacock & Co. Ltd., of Manchester

BY the courtesy of Beyer, Peacock & Co. Ltd., of Manchester, we are enabled to illustrate and describe the first order for British locomotives placed in this country by Persia. The design is new and up to date in every respect. Our illustration shows one of two coal-burning engines, which will work on the section from Bandar Shah on the Caspian Sea; three others are arranged for oil burning for operating from Bandar Shahpour, the new port on the Persian Gulf; both these lines, described in THE RAILWAY GAZETTE of October 13, 1933, are now being extended towards the capital, Teheran. All five engines ordered are identical, save for the differences brought about by coal and oil burning, the two coal burning engines being provided with rocking and drop grates, and arranged for easy conversion to burn oil when required.

The following are the principal leading dimensions:—

Cylinders (2) diameter × stroke	20 in. × 26 in.
Coupled wheels, diameter	4 ft. 0 in.
Truck wheels, diameter	2 ft. 9 in.
Wheelbase, coupled	14 ft. 9 in.
Wheelbase total, engine and tender	48 ft. 5 in.
Boiler, working pressure	175 lb. per sq. in.
Heating surface—	
Tubes	1,658 sq. ft.
Firebox	136 sq. ft.
	1,794 sq. ft.
Superheater (inside)	322 sq. ft.
Total	2,116 sq. ft.
Grate area	34 sq. ft.
Tractive effort at 85 per cent. B.P.	32,230 lb.
Maximum axle load	14·75 tons
Total weight of engine in working order	67 tons
Total weight of engine and tender in working order	116 tons
Water capacity of tender	4,400 gallons
Coal capacity of tender	9 tons

Boiler and Motion Details

The well-proportioned boiler, the centre line of which is 9 ft. 6 in. from rail level, has a length of 12 ft. 5 in. between tube plates and is provided with a copper firebox of the Belpaire type, and steel tubes. The smokebox end is closed with a drumhead tube plate. The dome base and top are of pressed steel construction, and through longitudinal stays are avoided by suitably arranged plate stays. The crown is supported by direct stays, expansion being provided at the front end by short longitudinal cast steel roof bars. Ample provision for washing out is provided by small manholes, further, there is provided a mud collector at the bottom of the barrel, and a blow off cock at the front of the firebox. Two No. 10 Gresham and Craven re-starting injectors deliver the feed through top feed clack boxes. The regulator is of the single-beat balanced type with pilot valve. The water gauges comprise one Klinger gauge and three test cocks. The boiler is lagged with asbestos mattresses and fitted with two 3 in. Ross pop safety valves.

The Superheater Company's superheater is fitted with an air valve at the top of the header. The smokebox fittings include draught deflector plates of special design to facilitate tube cleaning, while the coal burning engines are fitted with a conical spark arrester. The boiler is carried on a cast steel saddle at the smokebox end, and the firebox rests on a cast steel frame stay. The cylinders, it will be noted, are provided with tail rods and bye-pass valves, the piston heads, which are fitted with three cast iron rings, being of cast steel. The Walschaert valve gear is arranged with long travel, and the maximum cut-off is fixed at 75 per cent.; the reversing is by hand wheel and screw. The crossheads, of the single bar type, are fitted with gun metal slippers.

The engine is provided with a plate frame and cross stays of generous proportions to give adequate strength for the possibility of a somewhat uneven road bed during the rainy season, the horns being reinforced by cast steel horn blocks. Spring compensation is arranged in two groups, the leading truck and leading coupled wheel forming one and the remaining coupled wheels the other. The headstocks are provided with Turplat Noweld forged steel buffers, while the draw gear is of the English type with Spencer Moulton washers. The cab is of ample size to give good protection for the enginemen. Particular attention has been paid to the location of the fittings, which are named in the Persian language.

The Equipment

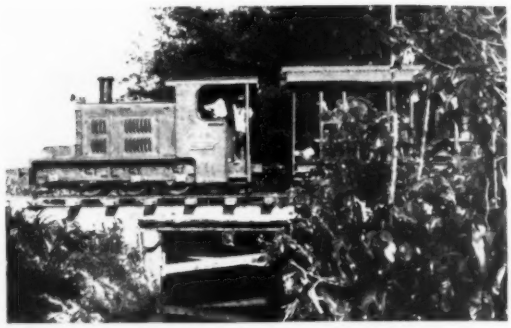
The principal fittings and equipment of the locomotives include airbrake of the Knorr type (auto and non-auto), as will be seen on the side of the smokebox, with compensated rigging, together with hand brake; train heating of the Westinghouse pattern; hand sanding; United Kingdom piston rod packing; Latowski bell, and Stones electric lighting. The lighting equipment includes additional points arranged under the running board of the engine and tender. The lubrication of the cylinders and steam chest is by means of Wakefield mechanical lubricator.

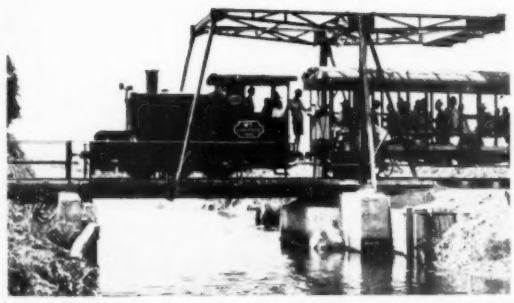
As regards the three oil burning locomotives, the burner is arranged at the front end. The oil tank in the tender is of welded construction and easily detachable. The eight wheeled tender has diamond-frame bogies of Continental pattern. The weight is carried on spherical side bearers, the centre pivot acting merely as a guide.

The plaques on the locomotive include the national emblem of Persia on both sides of the tender and on the smokebox door, while the name of His Majesty the Shah (Pahlevi) appears on the cab above the number and series of the locomotive; on the tender are the words "For Persian Government Railways."

The locomotives are designed for curvature down to 120 metres radius. The height from rail to top of chimney is 14 ft. $1\frac{1}{4}$ in., while the maximum width is 10 ft. 0 in. over platforms. These locomotives are now being shipped. The three destined for the Persian Gulf section will be erected at the workshops at Ahwaz, and the two coal burning engines will be transported to Batum on the Black Sea and thence by Russian Railway to Baku, finally crossing the Caspian Sea to Bandar Shah.

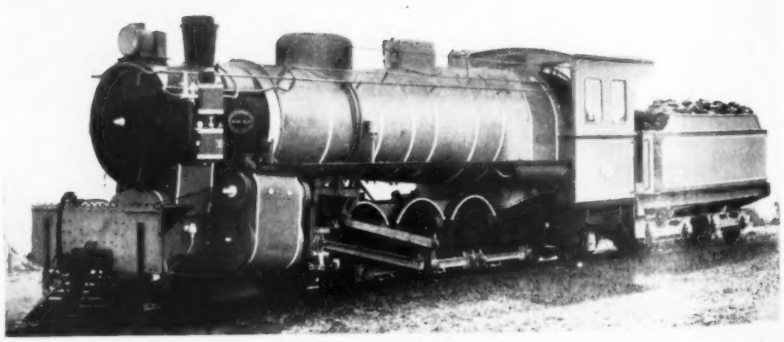
Our second illustration is of a photograph taken on the occasion of the visit of His Excellency the Persian Minister and Madame Hussein Ala to witness the steaming of one of the coal-burning locomotives. The two men in the cab are Persian student drivers who have attended the erection of the engines at the works of Beyer, Peacock & Co. Ltd.





Labour Transport in Demerara

Scenes on a sugar plantation railway in Demerara, British Guiana. (*See article on page* 555)



Four-cylinder compound locomotive used since 1908 *on the steeply-graded section of the North Island trunk line, New Zealand Government Railways.* (*See page* 538)

RAILWAY NEWS SECTION

PERSONAL

Sir Stephen Killik was elected on September 29 as Lord Mayor of London for the ensuing civic year. He is the compiler of the well-known Argentine Railway Manual, now in its 29th year of publication.

Mr. A. W. Arthurton, who is relinquishing control of the British Railways Press Bureau shortly, entered the service of the Great Western Railway

Photo] [Claude Harris

Mr. A. W. Arthurton

Secretary, British Railways Press Bureau, 1922-34

in the District Agent's Office at Norwich in 1888. He was transferred to the Chief Goods Manager's Office (Rates Section) at Paddington during the revision of rates and charges following upon the Acts of 1891 and 1892. The late Mr. J. L. Wilkinson (afterwards Sir Joseph) was then Chief Goods Manager, and Mr. Arthurton during this period gained considerable experience in the theory and practice of goods rates, and became versed in the numerous agreements which existed between the railways regarding routes and divisions. In 1907 he was transferred to the General Manager's Office under the late Sir James Inglis and was associated with Sir Felix (then Mr.) Pole in the production of the Great Western Railway Magazine and in other directions, and here also he had as a colleague the present General Manager, Sir James Milne.

Mr. Arthurton is justly proud of the fact that he was responsible for the conception of the Great Western Railway Lecture and Debating Society—one of the earliest of such societies—which is now in the thirty-first year of its existence and has a membership of 2,630. In collaboration with Sir Felix Pole, Mr. R. H. Nicholls and others he started the society and Mr. T. H. Rendell, then Assistant to the General Manager gave the first lecture. Mr. Arthurton acted as secretary of the society, in which post he was succeeded by Sir Felix Pole, and in later years was the first to win the General Manager's prize (offered by the late Mr. Frank Potter) for the best essay of the year. He has also contributed various papers to the proceedings of the society and has been a member of committee (with one short interval) since its commencement.

In 1910 Mr. Arthurton went to South Wales and gained much experience in traffic working in the Swansea District, but in 1914 returned to Paddington and was attached to the office of Superintendent of the Line where, under the late Mr. Charles Aldington and subsequently Mr. R. H. Nicholls, he acted as examiner in signalling throughout the system. He was also secretary of the G.W.R. Rules and Regulations Committee and for some years attended the Railway Clearing House with the late Mr. E. A. Bowden. In 1922 Mr. Arthurton succeeded Mr. W. H. Fraser in the control of what has since become the British Railways Press Bureau, which had been established by the Railway Executive Committee at Westminster after the war.

Mr. Arthurton is a Member of Council of the Institute of Transport and an Associate of the Institute of Journalists. In his younger days he took an active interest in rowing and swimming, being successively captain and chairman of the Pelican Swimming Club at Paddington, and holds the Royal Humane Society's certificate for saving life. He also helped to form the G.W.R. Athletic Association. During the whole of his railway career he has never been absent a day through illness.

Mr. Arthurton is sailing for Canada this month en route to New Zealand and Australia, and will contribute a series of transport impressions to THE RAILWAY GAZETTE during his tour.

In connection with the appointment of his successor the following official announcement has been issued:—

"RAILWAY COMPANIES' ASSOCIATION

"Mr. John R. Hind will take charge of the publicity work of the Railway Companies' Association under the title of British Railways Press Agent, with an office at 35, Parliament Street, Westminster."

Mr. Hind, who was born at Tynemouth, Northumberland, began his railway career in the Accountant's Office of the North Eastern Railway at Newcastle-upon-Tyne. He was subsequently transferred first to York, and then to the London office of the company at 4, Cowley Street, Westminster. For a number of years he acted as Secretary to Sir Alexander Butterworth, the General Manager of the North Eastern Railway. Nine years ago he took charge of the London and North Eastern Railway Press Section at King's Cross with the title of Information Agent, and has since been responsible for that section of the company's publicity work.

Mr. J. R. Hind,

Appointed British Railways Press Agent

We regret to record the death of M. René André, late Chief Mechanical Engineer of the Madrid-Saragossa and Alicante Railway, as the result of a fall from the Paris-Calais express on September 18. M. André had retired from active service only a few months ago, but continued to be connected with the company in a consulting capacity. The news of his death has been received with deep regret in railway circles in Madrid, and also among the French colony there of which for many years he was a distinguished member.

With regret we record the recent death, at the age of 78, of Mr. R. T. Morcom, at one time District Superintendent of the old London & North Western Railway at Birmingham. At the age of 18 Mr. Morcom joined the Traffic Department—in which he spent his whole service—at Mostyn, and was eventually appointed Outdoor Assistant to the Superintendent of the Line. In 1891 he was made Assistant

Superintendent of the Lancaster & Carlisle District, being transferred eight years later to the Liverpool (Northern) District. In 1907 Mr. Morcom went to Northampton as District Superintendent and after two years there was appointed District Superintendent at Birmingham, which position he held until his retirement in April, 1920. He was a very valued official of the L.N.W.R. and his death will be felt by many of his old colleagues.

Mr. R. S. H. Capes, who has been Deputy Secretary since 1931, has now been appointed Secretary of Dorman Long & Co. Ltd.

London Transport Appointments

In connection with the resignation of Mr. G. W. Duncan from the position of Publicity Manager, recorded in The Railway Gazette of September 28, Mr. W. Gott, Commercial Advertising Officer (Railways) and Mr. H. L. Spratt, Commercial Advertising Officer (Buses and Tramways), will continue to be responsible for their respective sections of the Publicity Department. Mr. H. T. Carr will be Acting Publicity Manager and responsible for the remainder of the work of the department including the press bureau, traffic advertising and public letters.

L.M.S.R. Northern Counties Committee Staff Changes

Mr. William Getty, Operating Superintendent, retired from the service of the committee on October 1, and in consequence, the following appointments have been made:—

Mr. Robert H. Murphy, Steamship Superintendent, has been appointed Commercial and Steamship Superintendent, and will take over the supervision of the Commercial, Rates and Claims Departments, in addition to his duties as Steamship Superintendent.

Mr. John Young, has been appointed Operating Superintendent, and will take over the supervision of the Railway and Bus Operating Departments, also of the Air Services.

Mr. James Hutton has been appointed Indoor Assistant to the Manager and Secretary.

A memorial service for Mr. Laurence Currie, Director of the Great Western Railway, was held on September 28 at St. Margaret's Westminster. Among those present were:—

Sir Robert Horne, Lord Palmer, Sir William James Thomas, Mr. Harold Macmillan, Mr. Cyril Lloyd, Mr. G. F. Luttrell, the Rt. Hon. the Earl of Mount Edgcumbe, the Hon. Rupert Beckett, the Hon. Eric Butler Henderson, Mr. R. Holland-Martin, Mr. T. S. D'A. Hankey (representing Mr. Charles Hambro), Mr. F. M. Spankie (representing the Mexican Central Railway Securities Co. Ltd.) and Mr. E. R. Bardsley (representing Sir Christopher Needham).

Mr. Ernest Cooper, General Manager of the Anglo-Argentine Tramway Company, returned to Buenos Aires from Europe on September 1.

We regret to have to announce the death of Exzellenz Dr. Alfred von der Leyen, who had been editor of *Archiv für Eisenbahnwesen* for more than half a century. A short account of Dr. von der Leyen's life appeared in our issue for August 10, on the occasion of his ninetieth birthday. He enjoyed remarkable health, but met with an accidental fall, breaking his thigh, about a fortnight ago, and complications set in which caused his death. Dr. von der Leyen was a link with the old Germany of pre-war years and will be greatly missed in railway circles.

The late Dr. Alfred von der Leyen.
Editor of *Archiv für Eisenbahnwesen*, 1879–1934.

We regret to note the recent death of Dr. Emile Leonard Elias, the Secretary of the Netherlands Railways. After a legal training and a clerkship in the Ministry of Public Works, Dr. Elias entered the railway service in 1903 as principal clerk in the Legal Department. Steady promotion followed and he became chief of the department in 1919, retaining this post until 1921, when the Holland Railway Company and the State Railways were brought under a common management. The principal legal post of the amalgamated concern passed to a member of the latter constituent system, and Dr. Elias became chief of the department dealing with staff matters. He managed this with such zeal and ability that the Board offered him the post of Secretary in 1924. Dr. Elias was also a member of the editorial committee of our contemporary *Spoor- en Tramwegen*, a Director of the South Beveland Railway Company, and a Member of the Board of the Dutch Employers' Federation and of the Central Committee for Efficient Transport. In addition, he was a Commissioner for the Co-operative Union of the Dutch Metal Industries and had acted as an adviser to the Transport Committee of the League of Nations.

We regret to record the recent death of Mr. J. H. Talbot, Secretary of Administration, United Railways of Havana, who was formerly special correspondent of The Railway Gazette in Cuba. Mr. Talbot served his apprenticeship on the Great Western Railway from 1906 to 1908, and in 1909 went as learner under contract to the Central Argentine Railway. In 1912 he became Private Secretary to the General Manager of the Argentine Railway Company which, at that time, controlled several important trunk lines. Afterwards he became Private Secretary to Mr. H. G. Cabrett, General Manager of the Cordoba Central Railway in the Argentine, and served in that capacity until the outbreak of the war, when he went to England and enlisted in the Royal Fusiliers. He was twice wounded in France and later gained a commission in the Royal Engineers, and finally completed his military service as Aide-de-camp to General Archibald Jack, C.B., C.M.G., C.B.E., then in charge of the British Railway Mission to Siberia. General Jack subsequently became General Manager of the United Railways of Havana and Mr. Talbot accepted the post of Secretary of Administration under him, and has since served in this capacity under three succeeding General Managers until his death.

Mr. Peter B. Wilson, whose appointment as Chief Accountant of the Southern Railways of Peru was announced in The Railway Gazette of August 10, qualified as a Chartered Accountant in 1926. From 1927 to 1930 he was engaged in Lima (Peru) with Deloitte, Plender, Sydney Merritt & Co., Chartered Accountants, and thereafter he was employed as Sub-Accountant of the Central Railway of Peru (Peruvian Corporation Limited). In April, 1933, he was appointed Acting Chief Accountant of the same railway, the post he held until his recent appointment noted above.

Indian Railway Staff Changes

Mr. G. J. Eades has been confirmed as Deputy Chief Engineer, Signals, N.W.R., as from August 12.

Mr. H. H. Yule has been confirmed as Deputy Chief Operating Superintendent, Movement, E.I.R., as from May 2.

Mr. P. L. J. Hands has been appointed to officiate as Deputy Controller of Stores, N.W.R., as from August 4.

Mr. J. A. Bell, Officiating Deputy Agent, Organisation, E.I.R., and member of the late Pope Committee, has been granted one year's leave as from October 5.

Wanted—a British Locomotive Testing Plant

Abstract of Presidential Address delivered on September 27 before the Institution of Locomotive Engineers by Mr. H. N. Gresley, C.B.E., Chief Mechanical Engineer, L.N.E.R.

When you did me the honour of making me your president seven years ago, the necessity for the provision of a national locomotive experimental station formed the main feature of my presidential address. It met with a most gratifying reception, and shortly after a committee was appointed by the Lord President to examine a proposal that such a station should be established. The terms of reference were as follows:—

To examine a proposal that a central locomotive experimental station be established under the auspices of the Department of Scientific and Industrial Research with the co-operation of the railway companies, the locomotive manufacturing industry and locomotive consulting engineers, and to submit a report, accompanied by plans of the buildings and layout recommended, *inter alia*, on:—

(*a*) the estimated capital and maintenance expenditure involved.

(*b*) the most suitable site for the station.

(*c*) the nature, composition, method of appointment, and powers of the body of management.

(*d*) the type of work to be undertaken.

The committee, which was composed of the Chief Mechanical Engineers of the four leading railway companies, three locomotive manufacturers, two prominent railway consulting engineers, two university professors, and a representative of the Crown Agents for the Colonies, under the chairmanship of Sir Alfred Ewing, was able to report unanimously in favour of the proposal and succeeded in framing a scheme adequate in its view to meet present needs and to allow for future expansion. The scheme provides for a station equipped with modern testing plant embodying certain novel features in construction, and a dynamometer car for use on the railway track itself. Of the usefulness of such a station there can be no doubt. The requirements of the export trade in locomotives and the conditions of railway transport at the present day indicate the need for better facilities for the scientific study of the locomotive than are generally available in this country in order that improvements in design, resulting in a higher standard of thermal efficiency and economies in fuel consumption, may be effected. The report was never published, as unfortunately, by that time, the need for national economy had become urgent, and there was no probability of the necessary capital being provided.

If a locomotive experimental and testing station were constructed, economies in fuel consumption and improvements in the design of locomotives could be effected. There is urgent need for the provision of facilities for the scientific study of the locomotive in operation. It is generally recognised that great benefits have been secured to many industries by the adoption of scientific research. Without research, waste and inefficiency are bound to continue and cannot be minimised. The need for research to secure greater efficiency has never been more fully realised than it is to-day. About six years ago the French engineers, who were fully alive to the benefits which would be derived from the provision of a testing station, were able to persuade the French Government that it was necessary to have such a station. Just over twelve months ago the French station at Vitry, near Paris, was opened, and the following day I had the privilege of seeing one of the largest express passenger engines undergoing tests at over 60 m.p.h. on full load in the new station.

This experimental station is the most perfectly equipped in the world for carrying out analytical and scientific research into the working of that most wonderful yet thermally inefficient machine—the railway locomotive. The station has been described in full detail in the technical press.* It is of interest to note that the hydraulic brakes, on the wheels of which the driving wheels of the locomotive under test are carried, and which can be regarded as one of the most essential features of the station, were of English manufacture. These brakes absorb the whole of the power developed by the locomotive, and are of such substantial design that each is capable of absorbing 1,200 h.p. continuously for long periods. The plant is designed to test locomotives having an axle load up to 30 tons running at all speeds up to 100 m.p.h. Provision is made for six hydraulic brakes so that locomotives having six driving axles and capable of exerting up to 7,200 h.p. can be tested.

There are also four new dynamometer cars, fitted with the most modern recording appliances, attached to the station. These are available for use in connection with trials in service on any of the French railways, and can also be used for checking the results of innovations which have been introduced as a result of research in the locomotive experimental station. The total cost incurred in the construction of the station was about £120,000, exclusive of the dynamometer cars.

The French railways, since the establishment some years ago of the Office Centrale des Études de Matériel in Paris, have made such pronounced progress in the design and scientific development of their engines that to-day their modern locomotives are second to none. The engines of the Paris-Orleans Railway, for example, have achieved results in the haulage of long distance high speed trains of great weight over a severely graded line which had never been attained by engines of similar weight. In preparing the designs of the new eight wheels coupled express passenger engine recently constructed at Doncaster, I did not hesitate to incorporate some of the outstanding features of the Paris-Orleans engines, such as the provision of extra large steam passages and a double blast pipe. There was no real novelty in these features, but the French engineers had worked out the designs scientifically and had proved them by the results obtained in actual service. The double blast pipe has two nozzles, each 5⅜ in. in diameter, whereas the usual single blast pipe has one nozzle of about 5½ in. diameter. The result is that the back pressure on the pistons is reduced from about 7 or 8 lb. per sq. in. to only about 2 lb. when running at speed. The establishment of the great new experimental testing station at Vitry is evidence of the confidence and conviction of the French engineers that progress can only be secured by full and complete research.

What have we here in England? A small locomotive testing plant of 500 h.p. capacity installed at the Swindon works of the Great Western Railway thirty years ago by Mr. Churchward, whose tragic death last year we all deplore. He was without doubt one of the most eminent railway engineers of recent times, and we see evidence of his influence in the designs of the most up-to-date engines of each of the great railways of this country. The Swindon plant is, however, much too small for modern locomotives. There are four dynamometer cars in existence on British railways, all of which I regard as almost obsolete when compared with modern cars. Now that trade is beginning to improve and the advantages of research are being so generally recognised, the time is surely opportune to re-open this most important subject.

The building of locomotives has been a national industry for over 100 years, and during the last few years that industry has been more depressed than almost any other industry in the country. Owing to the lack of facilities for carrying out research work, our locomotive designers and builders are working under disabilities when in competition with builders of foreign nations. The railways of our great Dominions and Colonies still purchase many of the locomotives they require. They purchase them in the open market. Price is not necessarily the ruling factor in awarding contracts, because up to a few years ago, owing to the superiority of design and workmanship of the British-built locomotive, practically all the orders were placed with British builders. Locomotive experimental stations in America, Germany and France are provided for the exclusive use of the railways of those countries. If a station of the most modern type were established here under the control of the

*It was the subject of a detailed description in last week's issue of THE RAILWAY GAZETTE.

Department of Scientific and Industrial Research, it would be available, not only for the British railways and for the Dominion and Colonial railways, but the locomotive building industry also would be in a more advantageous position in having facilities for experimental research. The need for a locomotive experimental and testing station is of national importance.

I do not see how the scheme can be financed by any of the interests concerned. The locomotive builders are not in a financial position to do so. The first call on the home railways, as trade improves, is to provide more rolling stock and give better facilities for handling traffic expeditiously. The Dominion and Colonial railways cannot be expected to provide money for such a station to be erected in England. It appears therefore to be a matter for the Government to finance such a station, and to set up an organisation under the Department of Scientific and Industrial Research for its control, with power to levy appropriate fees for its use.

Before concluding my address, it is appropriate to refer to the tendency to-day towards the speeding up of all trains, and to make some reference to the extra high speed passenger trains which have recently been introduced abroad. In this matter Germany has taken the lead. In France a similar service has been started on the Nord between Paris and Lille, and Bugatti cars are running on the Etat and P.L.M. In Holland and Belgium a number of diesel-electric high speed units are working, but the speeds attained are not so great as in Germany. On the other hand, it is claimed in the United States that even higher speeds up to 112 m.p.h. have been reached.

The question is naturally asked why has nothing been done here beyond speeding up the existing steam operated trains. The answer, of course, is the difficulty in finding on our congested railways a path for trains of such exceptional speeds. The permanent way of the British railways is well known to be the most perfect in the world, as is also the method of signalling, and there is no question that trains of the highest speed contemplated can be run with safety and comfort on our railways. It is not suggested that speeds much in excess of 100 m.p.h. can economically be maintained. The air resistance, notwithstanding scientific streamlining, absorbs so much power. Experiments with models of existing types of coaches carried out by the National Physical Laboratory show that the air resistance of trains of average length, say twelve coaches, at 100 m.p.h. is approximately double that of similar trains at 70 m.p.h. In the case of the Flying Hamburger, in which I recently travelled, it is calculated that 85 per cent. of the power generated by the diesel engines is absorbed in air resistance when running at 100 m.p.h. Streamlining is essential at extra high speeds because air resistance of trains increases approximately as the cube of the speed, but it is of comparatively negligible value at lower speeds, up to say 50 m.p.h. I think that the day is not far distant when heavy trains consisting of one class only will be run at speeds not less than the best speeds of to-day, and that short extra high speed trains, for which a supplement will be charged, will be run between London and the big industrial centres. The steam locomotive, however, of greatly improved efficiency, as a result of the establishment of a locomotive experimental station, will continue as the chief power unit operating on our railways.

Institution of Locomotive Engineers' Presidential Address

On September 27, before an attendance of about 160 members of the Institution of Locomotive Engineers and visitors, at the Institution of Mechanical Engineers, London, Mr. H. N. Gresley, C.B.E., Chief Mechanical Engineer, L.N.E.R., President of the Institution of Locomotive Engineers for the session 1934-35, gave his presidential address. His subject was "Locomotive Testing Stations," and an abstract of the address is given above. Those present at the meeting included:—

Messrs. W. A. Agnew, J. R. Bazin, A. M. Bell, A. J. Boyd, O. V. S. Bulleid, R. E. Bury, A. Campbell, K. Cantlie, A. C. Carr, J. Clayton, P. C. Dewhurst, Lt.-Col. E. Graham, Messrs. S. W. Groom, T. Horbuckle, A. D. Jones, R. E. L. Maunsell, H. W. H. Richards, A. Richardson, Lt.-Col. H. Rudgard, Messrs. W. A. Stanier, J. S. Tritton, Sir Seymour B. Tritton, Messrs. W. L. Watson, William Whitelaw and R. H. Whitelegg.

Major C. E. Williams, C.B.E., the retiring President, speaking from the chair, introduced the new President, Mr. H. N. Gresley, and expressed his pleasure at handing over the reins of office to so capable an engineer and organiser. He had been gratified to note the recent increase in membership. His year of office had passed quickly and had been to him a very happy and interesting experience.

Col. F. R. Collins, D.S.O., proposed and Mr. R. H. Whitelegg seconded a vote of thanks to the retiring President. Major Williams, in reply, stressed that much of the work for which they had thanked him had been shared by the Past Presidents, Members of Council and their Secretary. He had always found the Institution a useful source of knowledge and a stimulant in the work he had undertaken for the Colonial railways.

Mr. R. E. L. Maunsell, C.B.E., Chief Mechanical Engineer, Southern Railway, proposing a vote of thanks to Mr. Gresley, at the conclusion of his paper, said what he most admired was the bravery of Mr. Gresley in referring, before his chairman, Mr. William Whitelaw, to possible forthcoming increases in expenditure on locomotive renewals and repairs. He was glad Mr. Gresley had roused the scheme for a testing plant from the slumber induced by the bogey of finance. He did not suppose any other time could be more opportune. The steam locomotive was not dead, and, although both abroad and here attempts were being made by other means to reduce the cost of rail traction, such attempts were in the experimental stage. There was always too wide a gulf between the scientific and the practical side of engineering. A testing station would enable them to try out the many devices put up from time to time and would bring science and practice closer together, to the good of the country.

Mr. W. A. Stanier, Chief Mechanical Engineer, L.M.S.R., seconding the vote of thanks, expressed his pleasure at the generous references made by Mr. Gresley to his late chief, Mr. G. J. Churchward. Mr. Gresley, in reply, pointed out an advantage of a testing station which would appeal to his chairman. The economies realised by a saving of only half a pound of coal a mile, based on an average locomotive coal consumption of 50 lb. a mile, represented 1 per cent. of that figure. The total railways' coal bill in this country amounted to about £12,000,000 per annum, and a saving of 1 per cent. was £120,000 per annum, the estimated cost of the sort of testing plant he had in mind.

New Grimsby Fish Dock Opened

The new fish dock at Grimsby, described on its completion in our issue of September 21, was opened yesterday by Sir Henry B. Betterton, Bart., C.B.E., Chairman of the Unemployment Board. Accompanied by Mr. William Whitelaw, Chairman of the L.N.E.R., the Directors, the Chief General Manager, Sir Ralph L. Wedgwood, C.B., C.M.G., the Divisional General Manager, Mr. G. F. Thurston, and other railway and corporation officers, together with representatives of the engineering firms concerned in the constructional work, Sir Henry Betterton made a tour of the new dock in the trawler *Grimsby Town*. On coming ashore he declared the dock open and officially designated it as No. 3 Fish Dock. A short service was then conducted by the Rt. Rev. the Bishop of Lincoln. The proceedings terminated with the presentation of a souvenir of the occasion to Sir Henry Betterton by the Mayor of Grimsby, who also proposed a vote of thanks, seconded by Mr. William Whitelaw. Sir Ralph Wedgwood proposed a vote of thanks to the engineers and contractors. A souvenir programme has been issued in connection with the opening ceremony, containing an illustrated description of the enterprise and portraits of personalities connected therewith.

Opening of the Extension to Parkeston Quay, L.N.E.R.

On Monday last the extension of Parkeston Quay, L.N.E.R., which was illustrated and described in detail in THE RAILWAY GAZETTE of September 21, was officially opened for traffic, by Admiral of the Fleet, Sir Reginald York Tyrwhitt, Bart., G.C.B., D.S.O., D.C.L. On the arrival of the special train bearing the party of railway officers and guests, Admiral Tyrwhitt, after inspecting a guard of honour provided by H.M. Training Ship *Ganges*, briefly declared the new quay extension open. While the band of the Royal Marine Artillery played selections the guests were shown round the transit shed and then proceeded on board the s.s. *Vienna* where luncheon was served. Sir Murrough Wilson (Deputy Chairman, L.N.E.R.), presided, and among those present were the following:—

L.N.E.R. Board of Directors, Sir Charles Barrie, K.B.E., M.P. (Chairman of the Steamships Committee); the Hon. R. E. Beckett; Sir Charles Batho, Bart.; Sir Ronald W. Matthews; Sir W. Gray, Bart.; Messrs. O. R. H. Bury and W. B. Gair: also Her Worship the Mayor of Harwich; Admiral Sir Reginald and Lady Tyrwhitt; Sir E. Crowe, C.B.E., C.V.O.; Sir John Pybus (M.P. for Harwich); Captain J. W. Harris (Chief Marine Supt., L.M.S.R.); Messrs. E. C. Cox, C.B.E., M.V.O. (Traffic Manager, S.R.); E. J. Missenden (Docks and Marine Manager, S.R.); A. Maynard (Chief Goods Manager, G.W.R.); F. W. Lampitt (G.W.R.); Loftus Allen (Chief Publicity Officer, L.M.S.R.): Officers of the L.N.E.R., Messrs. G. F. Thurston (Divisional General Manager, Southern Area); A. L. Gibson (Continental Traffic Manager); C. J. Brown, C.B.E. (Engineer, Southern Area—under whom the new works were carried out); R. J. M. Inglis (Assistant Engineer, Construction, in charge of the works); E. L. Hawkins (Assistant Engineer, Maintenance); H. N. Gresley (Chief Mechanical Engineer); J. McLaren (Secretary); C. J. Selway, C.B.E. (Passenger Manager, S.A.); H. H. Mauldin (Supt., Eastern Section); V. M. Barrington-Ward, D.S.O. (Supt., Western Section); F. W. Noal, M.B.E. (Marine Supt. Engineer, Parkeston); H. W. H. Richards (Electrical Engineer); C. H. Newton (Chief Accountant); F. Downes (Signal and Telegraph Engineer, S.A.); O. H. Corble (Asst. to Chief General Manager); C. G. G. Dandridge (Advertising Manager); Capt. R. Davis, M.B.E. (Marine Supt., Parkeston); J. R. Hind; C. B. Smith; A. H. Peppercorn; R. Gardiner; R. R. Pettitt; A. J. Brickwell; J. Lees; L. H. K. Neill; F. Goodricke; J. E. Ryan; A. J. Bull; and Dr. C. G. MacMahon: also Messrs. B. J. Allison (K. L. Kalis & Co., dredging); D. W. & D. Jones (Yorkshire Hennebique Contracting Company, concreting); C. E. Knight and A. Scott (Ransomes & Rapier, cranes); R. B. Pitt (Stothert & Pitt, cranes); J. Aylmer (English Electric Company); H. J. S. Harper (Cockerills).

After proposing the loyal toast, the Chairman called upon Sir Charles Barrie to propose the toast of "The Royal Navy," coupled with the name of Admiral Sir Reginald Tyrwhitt. Sir Charles began by reminding his hearers of Admiral Tyrwhitt's long and intimate connection with Harwich during the war, when the forces there were under him. The ships based upon Harwich were, he said, always at sea literally, though never at sea metaphorically, one of their principal duties being to guard the food supplies from Holland, which were carried largely in L.N.E.R. steamers. So successful was the escorting of these ships by the Navy, that there was not one successful attack on them, and out of 3,500 vessels escorted, only six were lost. Sir Charles declared that at no port was there better and more friendly co-operation than between the Navy, the town of Harwich and the L.N.E.R., and pointed out that the quay extension would be very useful to the Navy. In conclusion, he formally presented Admiral Tyrwhitt with the key with which he had opened the extension.

Admiral Tyrwhitt congratulated the designers and builders of the new work and said that half of the old quay was occupied by the Navy from an early date in the war, and used for two repair ships, one for destroyers and one for submarines and a quay dockyard. Repairs could thus be completed in one quarter the time it took to send ships to a permanent naval dockyard for repairs. The other half of the quay was used by L.N.E.R. food ships, and co-operation with that company was admirable. The Harwich Naval forces accounted for 135 enemy submarines. He concluded by thanking his hosts for their hospitality and help to the Navy during the war and proposed the toast of the railway.

Sir Murrough Wilson replying, apologised for the absence of Mr. Whitelaw, who was attending a L.N.E.R. Scottish Board meeting and of Sir R. Wedgwood who was indisposed. He welcomed the guests on behalf of the company and said that at present the railway position was difficult to express. It was like a hospital patient, a little better, but its future was still uncertain and Parkeston Quay was like the clinical thermometer and showed by its traffic the general state of the railway's health. He hoped it would soon be very busy and he believed that the money spent on the extension had been well spent. But he emphasised that they wanted world prosperity and world trade revival. Railways get abused for lack of push, he said, but this could hardly be borne out by the construction of quay extension. After pointing out the help the extension would be to Harwich and the district, he congratulated those who had carried out the work and expressed his thanks to Mr. A. L. Gibson for the admirable arrangements he had made for their entertainment.

After the luncheon the s.s. *Vienna* took the guests for a tour of the harbour before their return to London by special train.

Train Arrangements for Launch of the "Queen Mary"

The fact that four separate railway routes lead from Glasgow to the vicinity of John Brown's yard explains why the large number of people who travelled to see the launch of the Cunard-White Star liner at Clydebank on Wednesday, September 26, experienced no confusion. Eight stations in the district were available and the flood of traffic was consequently spread over a wide area. The fact that the various stations were in close proximity to the different advertised vantage points also helped.

The L.N.E.R. ran a service from Glasgow, Queen Street, to Clydebank Central, Clydebank East, and Singer. These three stations are close to the yard. A service was also run to Dalmuir, both by the L.N.E.R. and L.M.S.R. The Dalmuir stations adjoin a derelict shipyard which was thrown open to spectators. Again, on the south side of the river Renfrew station was conveniently situated for the grand stands which had been erected in the fields opposite the shipyards. Accordingly, the L.M.S. ran a service between Glasgow, St. Enoch, and Renfrew, Fulbar Street.

Large posters at stations in the area showed the public the times at which the trains were due to leave for the various vantage points. Between 12.38 and 2.10, ten trains were advertised to leave Glasgow for Renfrew. A dozen trains ran from Glasgow Central to Dalmuir between 12 noon and 1.55, while a similar number left Queen Street for the L.N.E.R. stations. Special services ran citywards from the end of the ceremony until 5.17. The return fare from Glasgow to all stations except Renfrew and Dalmuir was 5d. The fare for the exceptions was 6d. The shipyard is about nine miles from the city.

September 26 was a day of Royal arrivals and departures at the Glasgow stations. The Prince of Wales arrived at Queen Street shortly after 11 a.m., having travelled from London by the East Coast route. He was greeted by Mr. A. B. Swan, Lord Provost of Glasgow, Lord Weir, Mr. Jackson, Mr. McKenzie, district superintendent of the L.N.E.R., and the stationmaster. Among those who met the Royal Train when it arrived at Glasgow Central from Ballater in the early afternoon were the Prince, the Lord Provost, Sir Josiah Stamp, and many other civic and L.M.S. officials. The King and Queen journeyed to and from Clydebank by road. The Royal Train left Glasgow again at 4.17 arriving at Aberdeen at 7.48 and Ballater at 9.20.

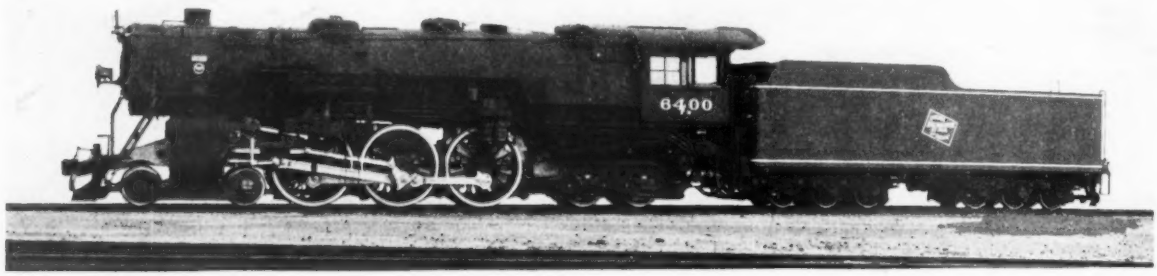
Cheap day tickets were issued from many stations to Clydebank on the day of the launch, while there was also

considerable traffic from England. On the night of September 26 the L.M.S. created a sleeping-car record. No fewer than 410 berths were reserved in the four portions of the Night Scot. Thirty-nine first class sleeping cars had to be pressed into service.

During the weeks before the launch special railway excursions were run to the area to let people see the liner on the stocks. On the last Sunday nine trains ran from St. Enoch to Renfrew. Perhaps the best view of all was to be obtained from the platform of Clydebank Central station. This platform was almost directly under the towering bows of the ship, and for three years the massive hull made an impressive sight for travellers. Now it is gone and leaves a gap to which it will take regular passengers time to become used.

A Record American Steam Run

As a preliminary experiment in connection with the forthcoming acceleration of train services between Chicago and Milwaukee, the Chicago, Milwaukee, St. Paul & Pacific Railroad conducted a remarkable speed test over the route on July 20 last. Within the limits of both cities, on account of grade crossings, freight yards, and curves, slow running is essential, and for this reason the start-to-stop time for the journey—85·0 miles in 67 min. 35 sec., which works out at 75·46 m.p.h.—did not, as has been suggested, establish a world's record for steam traction; the Cheltenham Flyer of the Great Western Railway has on numerous occasions exceeded this speed, including the record journey of June 6, 1932, when the start-to-stop average was 81·68 m.p.h. But over the level stretch of track through the open country between the city limits, this C. M. St. P. & P. RR. express probably achieved the fastest run for which steam has ever yet been responsible over a corresponding distance. The 68·74 miles from Mayfair to Lake, pass-to-pass, were covered in 45 min. 53 sec., at an average of 89·89 m.p.h., while the highest speeds were between West Lake Forest and Truesdale (24·65 miles in 15 min. 48 sec. = 93·61 m.p.h.) and Franksville and Lake (11·83 miles in 7 min. 29 sec. = 95·25 m.p.h.). On the latter stretch, near Oakwood, a maximum speed of 103·5 m.p.h. was recorded on the speedometer. It is unfortunate that the speedometer was apparently not checked by chronograph readings from mileposts, for the former cannot, of course, be accepted as unquestionably reliable without some such check. There were considerable fluctuations in speed between Mayfair and Glenview, showing averages of 62·2, 83·0, 71·0, and 85·7 m.p.h. in succession; such variations are most unusual over short distances in so high a range of speed as this, and suggest the possibility of minor errors in either the distances or the reading of the times.



Class "F6" 4-6-4 express locomotive, Chicago, Milwaukee, St. Paul & Pacific Railroad

The train consisted of five cars equipped with roller-bearings—a baggage car, two "coaches" (*i.e.*, passenger cars without supplementary fare), a parlour car, and a "business" observation car, weighing 72·0, 80·0, 76·5, 87·8, and 92·5 American short tons respectively. In English tons these weights work out at 64·3, 71·4, 68·3, 78·4, and 82·6 tons, and make up a total of 365 tons. No details are given in the report as to the weight of passengers and baggage carried, but the total may be assumed as not exceeding 380 tons at most. The engine was one of the large Baltic (4-6-4) type express engines, Class F6, of the C. M. St. P. & P. RR., No. 6402, built by Baldwins in 1930, with cylinders 26 in. × 28 in., 6 ft. 7 in. driving wheels, 6,020 sq. ft. of heating surface (including a superheater of 1,815 sq. ft. and two Nicolson thermic syphons of 90 sq. ft.), and a working pressure of 225 lb. per sq. in. In running trim the weight of engine and tender is 326·8 American tons (= 292 English tons). The trailing bogie of the engine, and the two six wheel bogies of the tender, are equipped with Timken roller bearings. Engine and tender alone weighed nearly as much as the five cars composing the train. The time for fast trains between Chicago and Milwaukee has now been reduced to 90 min., but on this occasion the accelerated schedule was cut by 22½ min., or exactly 25 per cent. Had the run been made from a start at Pacific Junction to a stop at National Avenue —a distance of 78·5 miles—the total time would probably not have exceeded 57½ min., and in that event the Great Western Railway 81·68 m.p.h. record of 1932 would have been just equalled, or, with a faster start, might have been fractionally improved on. But the average of 89·9 m.p.h. over the 68·7 miles from Mayfair to Lake was appreciably faster than the 87·5 m.p.h. of *Tregenna Castle* over the 70 miles between mileposts 72 and 2 on the G.W.R. 1932 run.

4-6-4 Engine No. 6402
Load: 365 tons tare, 380 tons full
Driver: H. Dempsey. Fireman: Ward Kirby

miles		min.	sec.	m.p.h.*
0·00	CHICAGO	0	00	—
3·00	Western Avenue ..	6	35	27·4
5·58	Pacific Junction ..	9	37	51·9
9·00	Mayfair	12	35	62·2
11·65	Edgebrook	14	50	83·0
14·41	Morton Grove ..	17	10	71·0
17·29	Glenview	19	11	85·7
24·16	DEERFIELD ..	23	53	87·7
28·05	West Lake Forest ..	26	29	89·8
32·19	Rondout	29	10	92·6
36·88	Wilson	32	08	94·9
42·88	Wadsworth	35	56	87·6
47·00	Russell	38	35	93·3
51·60	Ranney	41	32	93·6
52·70	Truesdell	42	17	88·0
57·48	Somers	45	35	86·9
61·78	STURTEVANT ..	48	33	87·0
65·91	Franksville	51	19	89·6
69·33	Caledonia	53	32	92·6
72·67	Oakwood	55	36	97·0
77·74	Lake	58	48	95·1
84·10	National Avenue ..	64	46	64·0
85·00	MILWAUKEE ..	67	35	19·2

* Average from station to station.

The Week's Road Accidents.—The Ministry of Transport return for the week ended September 29 of persons killed or injured in road accidents is as follows:—

	Killed	Deaths resulting from previous accidents	Injured
England ..	79	26	4,282
Wales ..	7	1	188
Scotland ..	13	4	419
	99	31	4,889

The total fatalities of the week, as the result of road accidents, were, therefore, 130, as compared with 161 for the previous week.

Labour Transport in Demerara

By L. A. Hares

(*See illustrations on page 548*)

One of the difficulties of the sugar industry is the huge spread of the cultivation. To keep an average-sized factory working sixteen hours a day for half the year, some 3,500 acres are needed. This is the acreage actually under cane; fields lying fallow, cocoanut cultivation and provision and rice farms add a good deal to the "spread" of the estate, so that the labourers often have to walk five miles or more to their work. Some estates have large areas of land suitable for cane which are not used because of their distance from the labourers' homes. Often inferior lands closer home have to be used for crop after crop when, if the far lands could be reached, these closer fields could be allowed to lie fallow and "rest" every few years.

This was especially true of Plantation Lusignan on the east coast of Demerara, British Guiana. The factory and dwelling houses of Lusignan lie in one corner of the estate and not in the middle. Enmore Estates Limited, the proprietors of Lusignan, have solved this problem of inaccessibility by laying down a light railway. The line runs a total distance of 5½ miles.

Two trains leave the station each morning, one at 6.15, the other at 7.15. They travel the 5½ miles in three quarters of an hour, stopping at several points on the way to set down passengers. During the crop season the first train homewards leaves at 5.30 p.m., the last at 5.40, but it runs an hour earlier in the slack season. A train consists of six coaches. Each coach is designed to carry fifty people with comfort, but a train sometimes carries five or six hundred, so popular is the "Flying Demerarian." There are no fares to pay on this railway!

Riding to and from their work in this way saves the people two fatiguing journeys daily and gives them at least two hours longer in the fields, so that they are able to earn more and yet be fresher at the end of the day. Not only are residents on the estate benefited, but people from neighbouring villages are enabled to get work which would have been too far away but for the railway.

The levelling of the dam which was to take the track began in March, 1933. In September of that year the laying of the rails was started. By February, 1934, some three miles of track were finished and trains began to be worked, their run increasing as the track advanced. The railway was completed in May last. The rails were supplied by C. J. Chapman Limited, of London. The track is of 3-ft. gauge, and is laid on some ten thousand reinforced concrete sleepers, all of which were made on the estate. Wooden sleepers have been used only for the crossings and curves, where their flexibility is needed; the concrete sleepers are stiffer but much more durable.

On this, as on all Demerara sugar estates, the reaped canes are transported to the factory by water—the plantation being a regular network of canals. At a spot about four and a half miles from the station the railway crosses one of these canals. Here it was necessary to provide a lift bridge, supplied by Head, Wrightson & Co. Ltd. of Teesdale Iron Works, Thornaby-on-Tees. It was erected in two weeks by a native crew under the supervision of two of the European staff of the estate. As one locomotive and part of its train puts a weight of fifteen tons on the bridge, and the bridge itself weighs fifteen tons, the foundations had to be very solid, so that close on two hundred tons of reinforced concrete went to the making of them. One man, turning a hand winch, can raise the bridge to allow the cane barges to pass. The total cost of the bridge, including erection, was £833.

John Fowler & Co. Ltd. of Leeds, supplied the two locomotives. These each weigh ten tons and are propelled by a 45-h.p. diesel engine driving six coupled wheels. The bogies and frames of the coaches were also made by John Fowler & Co. Ltd. of Leeds, but the woodwork, except for one car sent out as a pattern, was done on the estate.

Apart from an East Indian platelayer foreman kindly lent by the Government Transport & Harbours Department, none of the workmen who built the railway had any previous experience of such work. They were all either East Indian or Negro, and the company's motor expert trained a crew of East Indian drivers for the locomotives.

The Lusignan railway cost about £17,000, but it fulfils a great need and will in time pay for itself by speeding up the work of the estate and conserving the health of the labourers. The need of this sugar estate is the need of others in Demerara and elsewhere. Centralisation is becoming more and more necessary for the reduction of production costs, and as small estates join up to form big ones, the problem of labour transport will confront them. Here is a market which the light railway manufacturer would do well to investigate.

Welding Rails in N.S.W.

In a recent quarterly report of the New South Wales Department of Railways mention was made of the fact that Thermit welding of the track was being continued. Mr. W. H. Newman, the Secretary for Railways, has since sent us some notes upon the practice of end to end rail welding on the New South Wales Government Railways. Welding was adopted because of the following advantages:—

(1) Increased comfort to the travelling public owing to smoother and more silent running, which in these days of increased competition from road transport is a most important feature, although one that cannot be reduced to terms of money.
(2) Reduction in wear and tear of rolling stock.
(3) Increased life of rails, which is largely conditioned by battering of the joints.
(4) Reduced fettling of the road, permitting staff reduction, or alternatively, allowing the permanent way men to give more attention to other duties.
(5) Elimination of bonding in electrified areas and improving conductivity for signalling purposes outside electrified areas.

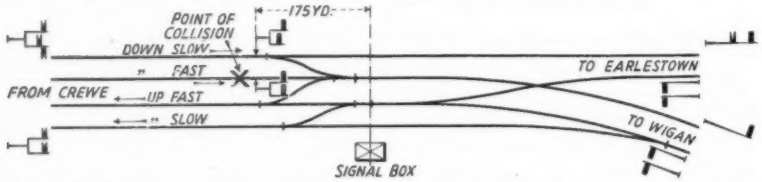
Rails are welded to maximum lengths on the inside and outside rails respectively of 90 ft. and 135 ft. on curves up to 20 chains radius, 145 ft. and 180 ft. on 21 to 30 chain curves, 180 ft. to 225 ft. on 31 to 40 chain curves, and 225 ft. on both rails where the curvature is flatter than 40 chain radius.

In Woy Woy tunnel the double line was recently re-laid with continuous Thermit welded rails to within 45 ft. of the tunnel mouth at each end. The method of carrying out this work is of interest. Eight lengths of rail, each consisting of 32 45 ft. rails, were welded outside the tunnel for each track. These were suspended in pairs from trolley axles spaced at 22 ft. 6 in. centres and pulled into the tunnel by an engine. The six joints in each track were then welded in the tunnel, resulting in continuous lengths of 5,760 ft. without a joint. This work was completed in July, 1933, and no trouble has been experienced in holding the track to line.

Up to the present only Thermit welding has been used on the N.S.W.G.R. By the middle of June, 13 track miles of welded rails had been laid in conjunction with re-railing operations, and a further seven miles had been welded in situ. The cost of a Thermit welded joint for 100 lb. flat-footed rails is given as 38s. as against 33s. 3d. for a bonded mechanical joint fitted with a bridge plate in the electrified area and 27s. 3d. for a mechanical joint with signal bonding and a bridge plate outside the electrified area. This cost is made up of 27s. for material and 11s. for labour in the case of rails welded outside the track, and 29s. 6d. for material and 8s. 6d. for labour for rails welded in situ. In the latter case the material is increased by an amount of 2s. 6d. for the provision of a rail insert to take up the existing expansion gap, but labour is less owing to the reduced amount of lifting and handling of the rails. We refer to this matter in an editorial note on page 531.

The Winwick Junction Collision

Some 3½ miles north of Warrington is Winwick Junction. It is situated on the Newton & Warrington Railway, opened in 1831, which connected the Liverpool & Manchester Railway to Warrington. Twelve months later the Liverpool line was joined by a branch to Wigan which left the main line at Parkside. When railway communication was established throughout from Euston to the North the trains travelled via Parkside until, on August 1, 1864, a direct line was laid in between Winwick Junction and Golborne Junction. The lines to-day at Winwick Junction and the signals are as shown on the accompanying sketch, and the only information we need add thereto is that the three signalboxes, on the Warrington, Earlestown and Wigan sides are Winwick Quay, Vulcan Bank and Golborne Junction.



It was at Winwick Junction that a very serious collision occurred on the evening of Friday last, September 28, in which ten passengers and a guard were killed. The facts were very frankly related by signalman William Bloor at the coroner's inquest on Tuesday. He said that at 8.48 p.m. a goods train came to a stand at the home signals for the down slow line. That train, by the way, was still there after the collision and was not concerned in the accident. At 8.55 he dealt with a train on the down fast which was followed by the first of the trains concerned in the collision. That was a passenger train from Llandudno to Manchester via Earlestown. It travelled over the down fast line and was properly dealt with by the block and fixed signals. Then at that time Bloor was worried over the running of three up trains, and it also came into his mind that he must have a road for the 5.20 p.m. express from Euston to Blackpool. Meanwhile he was offered by Winwick Quay a local passenger train from Warrington to Wigan via Earlestown. He accepted the train but kept his signals "on" because of the other movements he had in view. In due course the local train arrived at the home signals for the down fast line. The Blackpool express was afterwards offered which Bloor, forgetful of the local train, proceeded to accept. On finding his block indicator, however, at *train on line*, he irregularly assumed that he had failed to clear the Llandudno train. He, thereupon, gave train-out-of-section for what he thought was the Llandudno train, but which, actually, was the local, and accepted and lowered his signals for the Blackpool train. Meanwhile the driver of the local train had sent his fireman to the box, and when Bloor saw that man he jumped to the conclusion that he was from the goods train on the down slow. The driver of the local train, when he observed the home signal for the line to Wigan put to "clear," wondered why that was so, as he wanted that for going to Earlestown. Nothing, though, could be done and the collision resulted. Answering the jury, Bloor said that whilst his work had increased of late it was no greater than before the slump set in. He had not asked for assistance nor was that, in his opinion, necessary.

The coroner said that the railway company had placed themselves at his disposal and had reproduced the block instruments, &c., and the signal diagram in the court for the guidance of the jury. Two statements handed in showed that 310 trains, of which 173 were passenger trains, passed the box each day of 24 hours, and that the average number of lever and block instrument movements were 375 per hour or say 3,000 movements to each 8 hours shift. In summing up the coroner said that the travelling public might rest assured that there was no safer place in the world than in a railway train. They should be very grateful that their safety was in the hands of men of such a character as Bloor who had been a signalman for 32 years and in Winwick Junction for 21½ years, and had never had an accident of any kind. It was only human nature to err and he thought that Bloor, at the time of the accident, was performing his duties as faithfully and as honestly as at any time during all those years. They could not say a word against a man who had given his evidence so frankly. He thought it was a case of momentary forgetfulness, due to the frailty of human nature and that the passengers met their death by misadventure.

The jury gave a verdict of "death by misadventure." They added no rider, beyond an expression of sympathy with the sufferers from the accident. Mr. G. A. Challenor expressed the sympathy of the President, directors and officers of the L.M.S. Railway and their appreciation of the help given by doctors, nurses, ambulance men, police, owners of motor cars, &c. on the unfortunate occasion. Among those who rendered great assistance was the ambulance team of the Vulcan Foundry Limited.

Colonel Trench, on behalf of the Ministry of Transport, inspected the scene of the accident on Tuesday afternoon and held his inquiry at Crewe on Wednesday. No new facts as to the cause of the accident were revealed, but testimony was given as to how steel rolling stock and shock absorbing buffers reduced the effects of a collision.

Sir Josiah Stamp, on his return from the scene of the collision, discussed with a press representative the question of providing all-steel coaches on British railways. He said that the company was watching the position very carefully. It had experimented with steel carriages and had a lot of steel stock. He had heard it suggested that all-steel carriages would save life in railway disasters, but that was a matter upon which there was a wide difference of opinion. At any rate, it was safe to say that the rolling-stock had nothing to do with the accident at Winwick Junction. Both the carriages in which loss of life took place were of the usual modern type with steel undercarriages and wooden bodies. It may be recalled that we discussed this question at some length in an editorial article in THE RAILWAY GAZETTE of May 4 last (page 779).

A New Flame-Resisting Wax

A demonstration of the flame-resisting qualities of the new Seekay non-inflammable wax was given this week by Imperial Chemical Industries Limited. Seekay wax, which is a synthetic product manufactured by the controlled chlorination of naphthalene, can be supplied in a number of grades covering a wide range of melting points from 65 to 120 degrees Centigrade. It also has valuable insecticidal, fungicidal, and waterproofing properties.

The tests which comprised the demonstration were to show the especial application of the wax to the insulation of electric cables, and to rubber flooring. In the case of cables three different applications of Seekay wax were submitted to test. They were:—

(*a*) A rubber insulated cable, the wax being incorporated in the rubber.

(*b*) A cotton-sheathed insulated cable, the wax being used as an impregnant for the cotton instead of paraffin wax.

(*c*) A lead-sheathed cable, the wax being used as an outer covering instead of bitumen.

In each case the flame-resisting qualities of the wax were shown to be indisputable. Moreover, it was clear that the wax limited the fire to its seat of origin, the fire being prevented from spreading along the cable. To demonstrate the insecticidal and fungicidal properties, specimens of ordinary and Seekay wax treated cable, both of which had been buried in the ground for a similar period in Central Africa, were produced. The ordinary cable had suffered considerably, but the wax treated cable remained unimpaired. The value of the wax in rubber flooring was shown by the fact that whereas ordinary rubber will burn and help to spread fire, Seekay wax limits fire to a local smouldering.

Burlington Zephyr's World Record Run

A whole sheaf of rail records was broken by the astonishing journey made by the new Burlington Zephyr stainless steel diesel three-car articulated unit of the Chicago, Burlington & Quincy RR., on the occasion of an experimental run from Denver to Chicago on May 26 last. In the first place, the longest non-stop railway run in the world was put completely in the shade with a non-stop journey of 1,015·4 miles, lasting from dawn until dusk. Starting at 5.05 a.m., Mountain Time, from Denver, the Zephyr completed the journey at 7.10 p.m., Central Time, a total of 13 hr. 5 min. This works out at an average of 77·5 m.p.h. throughout, inclusive of all necessary slowings through cities and towns, and elsewhere. The times were taken only to the nearest half-minute, but with all allowance for approximation, it is clear that some extremely high speeds were obtained. A maximum speed of 112·5 m.p.h. is claimed, and also a time of 11 min. for the 19·1 miles from Otis, Colorado, to Schramm, which works out at 106 m.p.h. From Otis to McCook, Nebraska, a distance of 129·5 miles was completed in 86 min., at an average of 90·2 m.p.h. Another fast stretch was the 124·7 miles from Galesburg to Aurora, covered at a mean speed of 87·0 m.p.h. Obviously no journeys on rail over 200 miles long have ever been made at such a speed previously; indeed, allowing for the speed reductions previously mentioned, it is reckoned that an aggregate distance of 215 miles was reeled off at an average speed of 90 m.p.h. The crude oil consumed on the journey totalled 418 gals., the approximate cost of which was $16, which works out at less than 1d. per mile. The time of the best ordinary express service of the C.B. & Q. from Denver to Chicago—26¼ hrs.—was almost exactly halved.

THE BURLINGTON ZEPHYR, MAY 26, 1934

Stations	Distance	Time	Speed†
	miles	Mountain Time a.m.	
Denver (Union Stn.)	0·0	5 05	—
Fort Morgan ...	78·0	6 13½	68·3
Akron	111·4	6 42	70·3
		*Central Time	
McCook	254·3	9 19	88·4
Hastings	385·6	10 57	80·4
		p.m.	
Lincoln	482·6	12 12	68·5
Pacific Junction...	542·3	1 10	61·7
Creston	624·5	2 11	80·8
Burlington ...	811·9	4 38	76·5
Galesburg ...	855·1	5 15	70·1
Aurora	979·8	6 41	87·0
Chicago (Halsted St.)	1,015·4	7 10	73·6

† Average speed, station-to-station.
* Deduct 1 hour from subsequent times.

Elaborate precautions were taken to ensure a perfectly clear road and safe journey. The engineering department of the railway checked the profile and the superelevation of curves, prepared charts showing the permissible maximum speeds throughout, and placed markers along the route wherever speed reductions would be called for. Railway officers conferred with the municipal authorities of 164 cities and towns to be passed through, to safeguard the passage over every highway and street crossing; two flagmen were stationed at every one of the 1,070 public crossings between Denver and Chicago and one at each of 619 private crossings, to safeguard pedestrians and vehicular traffic. Consequently, though half-a-million people are estimated to have watched the passage of the special, there was not a single casualty. Even at dawn in the sparsely-populated districts of Colorado, hundreds of motor-cars lined the track, and as the train neared Chicago, there was an unbroken line of spectators stretching for miles on end. Additional precautions consisted in the double manning of all signal and interlocking towers, the spiking of all switches, the wiring of all mail standards, water-cranes and other movable objects at the track-side. By virtue of its low centre of gravity, the Burlington Zephyr was able to take numerous curves on the route at a speed of 90 m.p.h., without discomfort to the passengers, and the performance of this notable speed achievement with entire absence of accident reflects great credit on all concerned.

G.W.R. Application for Road Licences for Goods and Parcels Lorries

We referred last week on page 507 to the adjournment of the hearing in respect of the G.W.R. Company's application for motor licences under the Road & Rail Traffic Act, 1933. On Tuesday last at Exeter the application which, for the whole of the Western Licensing area covers "claimed" motors totalling 428 with 45 trailers and "discretionary" vehicles totalling 96 motors 26 trailers, met with fierce opposition from the Road Haulage Association representing 84 objectors, the witness for the company being subjected to three hours searching cross-examination.

The hearing opened with an ingenuous request for the production of railway rate books, which, as counsel for the company pointed out, would have meant the assembling from all points of Great Britain of 19,200 bulky volumes with a gross weight of 12 tons. The application was not pressed nor was its motive explained. With the advantage of voluminous details as to the company's tonnages at the 74 stations concerned, which had been supplied prior to the hearing, the objectors represented by Mr. Watson subjected each demand to microscopic examination, laying immense stress on the fact that at many places a large proportion of the claimed tonnages of road operators was lying idle. It was urged that if, as was understood, the Traffic Commissioner was aiming at the maintenance of the status quo, it was clearly wrong that the railway company should be allowed to add so substantially to the number of vehicles on the road.

Mr. Tee, Assistant Road Transport Superintendent, giving evidence for the Great Western, stated that the company by no means neglected the resources available when emergencies rendered this necessary, but that for the normal conduct of the company's business it was preposterous to suggest that a railway could rely upon casual hire. An absolute guarantee that suitable equipment was available at the time it was wanted and at short notice was vital to the efficient conduct of railway operations. Congested terminals meant a general slowing up of traffic movement, a shortage of trucks and in fact, when carried far enough, complete paralysis of traffic operations.

Mr. Watson then strongly pressed for an undertaking that the company would confine itself strictly to the cartage of railborne traffic. The witness stated that to concede such a request would make the Railway Road Acts of 1928 futile and unnecessary. He pointed, however, to the inevitably strong bias in favour of rail transport inherent in all railway operators which was reflected in the extremely minute percentage which this type of traffic bore to the total of the collected and delivered tonnage. An attempt was made to prove the railway company guilty of cutting rates inasmuch as its "delivered" rates for grain included an amount too small in the objectors' view to cover the cost of cartage. Mr. Woodward, for the company, stated he must advise the witness not to answer questions as to the reasonableness or otherwise of rates which had been approved by the Railway Rates Tribunal, that body alone being competent to deal with the point. The whole of the vehicles applied for were granted, the Commissioner, Mr. Nicholson, adding that he felt bound to congratulate the company on the able and convincing way in which its case had been prepared.

NOTES AND NEWS

Standard Station Signs, L.M.S.R.—A new standard colour scheme has been adopted by the L.M.S. Railway for the name boards on station platforms. They will have the name and margins in black on a yellow ground.

Wages on the Great Southern Railways.—The National Union of Railwaymen has made application to the Great Southern Railways Company for the restoration of the 10 per cent. cut in railway shopmen's wages which was accepted in 1929. The men affected number about 4,000. They are employed at Dublin, Limerick, and other centres.

P.L.M. Bugatti Railcar Service.—The Bugatti railcar service between Paris and Lyons, to which reference was made in our last issue, is now announced to begin on Sunday, October 7, and to operate daily until further notice. It will leave Paris at 8 a.m., arriving at Lyons at 12.50 p.m. The return journey will be from Lyons at 18.40, arriving in Paris at 23.38.

The Liverpool-Amsterdam Air Service.—The service operated by the Royal Dutch Air Lines between Amsterdam, Hull and Liverpool will be suspended for the winter on October 6, but is to be reinstated with a revised timetable next April. A machine will then leave Liverpool in the morning, instead of at midday as at present, and allow business men to spend a whole day in Hull or several hours in Amsterdam, returning the same night. There will be railway connections at Hull with Leeds, Bradford and Doncaster, and improved connections with air services on the Continent. From the date of inauguration on June 1 last, until September 1, bookings for journeys confined to the inland section of the route between Hull and Liverpool numbered 207. In the same period 518 passengers crossed the North Sea by this service. At a conference arranged by the Hull Development Committee on Tuesday, October 2, the desirability of internal air feeder lines to Hull as a factor in developing the Continental traffic was put forward. Mr. E. Y. Marsden, representing Railway Air Services Limited, said that a survey of the east coast area had been made with a view to developments.

Australian Railway Working.—A report on economic conditions in Australia issued by the Department of Overseas Trade contains certain figures relating to railway operation in 1932-33 supplementary to the financial results published in our issue of January 12 last. Total mileage open is shown as 27,040, an increase of 81 miles compared with the previous year. At the end of 1933 it had reached 27,108 miles. Train miles run were 63,617,000, against 63,832,000, but the number of passenger journeys increased by 11,904,000 to 314,773,000. Freight tonnage also rose, from 26,072,000 to 27,258,000. The percentage expenditure on earnings was reduced to 73·3 per cent. from 74·88 per cent. ruling previously.

Polish Railway Collision.—Two express trains collided in a fog outside Krzeszowice early on October 2, and 12 persons are reported to have been killed.

Railway Convalescent Homes' Dinner.—Sir Murrough J. Wilson, K.B.E., Deputy Chairman of the L.N.E.R., will take the chair at the Family Dinner of the Railway Convalescent Homes in the Wharncliffe Rooms, Hotel Great Central, on Saturday, November 3, in the unavoidable absence of the President, Mr. William Whitelaw.

Another Flying Hamburger Trial.—On the occasion of a recent trial run, the Flying Hamburger is reported to have covered the 334 miles from Berlin to Frankfurt in 4 hr. 59 min., equivalent to an average speed of 67 m.p.h. The fastest steam journey over this route in the down direction is made by train FD in 6 hr. 46 min., including a 6 min. stop at Erfurt and a 1 min. stop at Weimar.

Dutch Streamlined Electric Trains.—For use on the Rotterdam-Hook of Holland line, which is now being electrified, three two-car electric trains are being built by Werkspoor N.V., of Amsterdam, to the order of the Netherlands Railways. These trains are to be twin-articulated units driven by four nose-suspended traction motors, and the streamlining, interior arrangements, and heating equipment are to be similar to those of the 40 diesel-electric trains. The overall length will be 141 ft., the tare weight 64 tons, and the seating capacity 114 in two classes.

Institute of Transport Awards.—The Council of the Institute of Transport has made the following premium awards in respect of the session 1933-34 :—

Railway Operating Medal (donor : The Railway Companies Association) to C. M. Jenkin Jones (Member), Superintendent, North Eastern Area, L.N.E.R. Road Transport Medal (donor : The Commercial Motor Users Association) to H. Alker Tripp, Assistant Commissioner, Metropolitan Police. Road Transport (Passenger) Medal (donor, The London Passenger Transport Board) to G. F. Sinclair (Member), Rolling Stock Engineer, Tramways, L.P.T.B. Dock and Harbour Silver Medal (donor : The Dock and Harbour Authorities Association) to A. G. Course (Associate Member), of the Port of London Authority, Tilbury. Institute Graduate Medal to C. E. Whitworth, of the L.N.E.R. Institute Student Medal to R. S. F. Jefferies, of the G.W.R. *Modern Transport* Premium to J. W. Hutcheson (Graduate), of the L.N.E.R.

Locomotive Engineers' Golfing Society.—The first meeting of this newly-formed society was held at Brocton Hall Golf Club (Stafford) on Saturday, September 22. On the preceding evening the inaugural meeting of the society was held, followed by a dinner in the club-house, at which the election of officers took place. Mr W. S. Edwards was elected captain, and Commander H. V. Gaud and Messrs. J. N. Gresham and F. D. Playford on the committee, Mr. K. F. Pearson being appointed honorary secretary. At the meeting on Friday evening it was resolved to hold two meetings a year—in the spring and the autumn—the perpetual cup to be played for at the autumn meeting.

Launch of L.N.E.R. Ferry Steamers.—The two new L.N.E.R. ferry steamers to be used on the Hull-New Holland service, the ss. *Tattershall Castle* and ss. *Wingfield Castle*, were launched on September 24. The builders are William Gray & Co. Ltd., of West Hartlepool.

Institute of Transport Congress and Summer Meeting, 1935.—It has been provisionally arranged for this event to be held next summer in Austria from May 18 to June 2. The proposed itinerary is : London-Innsbruck (*via* Calais and Basle)—Salzburg — Linz — Vienna — Badgastein — Schwarzach St. Veit—London. The programme, including visits to centres and works of transport interest, will be circulated to members shortly.

Second "Cock o' the North" Engine at York Exhibition.—A feature of the L.N.E.R. exhibition to be opened at York on October 14 will be the second locomotive of the 3-cylinder, 2-8-2 "Cock o' the North" class, the name of which, it is announced, will be *Earl Marischal*. The 4-6-4 high-pressure locomotive No. 10000 and the standard Pacific, *Flying Scotsman*, will also be on view, and the assembly of these three modern types in proximity to the veterans in the York Railway Museum will add interest to the display. Visitors will be able to ride on platelayers' motor trolleys and manipulate signals.

Agreed Charges.—Nineteen more applications for the approval of agreed charges under the provisions of Section 37 of the Road and Rail Traffic Act, 1933, have been lodged with the Railway Rates Tribunal, as will be seen from the legal notice published on p. 561. These applications may be inspected at the office of the Tribunal, 2, Clement's Inn, Strand, W.C.2, at the Railway Clearing House, London, and at 11 named centres outside London. A copy of each application (1s. post free) may be obtained from Mr. G. Cole Deacon, Secretary, Rates and Charges Committee, 35, Parliament Street, S.W.1. Notices of objection must be filed at the office of the Registrar (2, Clement's Inn) on or before October 23.

Fog Notices for Passengers.—Telephone subscribers in the London area who travel to business by the L.N.E.R. (G.N. and G.E. sections) and Southern Railway suburban routes can be immediately informed this winter of whether a fog service is in force by ringing up their local exchange. By

arrangement between the railway companies and the post office authorities, whereby stationmasters notify the exchanges of conditions from time to time, this facility has been available for Southern Railway suburban passengers since October 1, and will apply on the L.N.E.R. from October 8.

Railway Accident in Portugal.—The driver and stoker were killed and many passengers seriously injured when an express on the Vouga Valley line was derailed on September 24. According to Reuters, the driver and fireman were killed and many passengers injured.

Belgian National Railways Steamer to be Sold.—The Marine Department of the Belgian National Railways is offering for sale by auction the steamer *Stad Antwerpen*. The sale will take place in Belgium on October 17. Inspection of the vessel at Ostend is invited.

Opening of Vatican Railway.—On October 2 delegations representing the Italian Government and the Papal authorities travelled from St. Peter's to the Vatican station over the new line of railway, to mark its formal opening. The Vatican Railway was briefly described and illustrated in our issue of September 21.

South African Electrification.—Authority has been given for the electrification of two further sections of the Natal main line, *viz.*, from Cato Ridge to Durban, and from Glencoe to Volksrust. This conversion work follows the recommendations of the Granet Commission. No further electric stock will be required for the Volksrust extension, but additional power vehicles and a number of substations will be required for the Cato Ridge-Durban division.

New Special Train for Turkey.—An Exchange message from Berlin states that an order has been placed in Germany for a special train for the use of Mustapha Kemal, the Turkish Dictator. The train, consisting of nine coaches, will be equipped for long journeys with sleeping accommodation and kitchens. Telephones will connect the coaches, and wireless apparatus for receiving and transmitting messages will be installed.

L.N.E.R. Musical Society.—The twenty-sixth annual meeting of the members of the L.N.E.R. Musical Society was held at Liverpool Street station on September 26, Mr. William Whitelaw, President of the Society, presiding. After the adoption of the report and balance sheet, a vote of thanks to the Chairman, directors and officers of the L.N.E.R., and to the Chairman, committee and officers of the society, was proposed by Mr. G. H. Picton and seconded by Mr. T. G. Ritchie. Mr. G. F. Thurston, Chairman of the Committee, responded. A short account of the activities of the society during the past year was given by Mr. A. W. Headley, the Hon. Secretary, after which a vote of thanks to Mr. Whitelaw was proposed by Mr. C. J. Selway and seconded by E. F. Warren. In his reply, Mr. Whitelaw referred to the sad loss sustained by the society in the death of Lord Faringdon, who had been its Deputy President since the grouping in 1923. He expressed himself highly satisfied with the work of the choir and orchestra and spoke of the intellectual well-being of the staff promoted by the activities of the society.

Crompton Parkinson Subsidiaries.—A further extension of the activities of Crompton, Parkinson Limited is the formation of a new subsidiary, the Atlas Sprinkler Co. Ltd., which will carry on the business of the manufacture and installation of automatic sprinklers and other fire-protection apparatus. Among the companies now controlled by Crompton, Parkinson Limited are: Derby Cables Limited, British Electric Transformer Co. Ltd., F. and A. Parkinson Limited, Crompton Kye Lamp Sales Limited, Kye Electrical Limited, and British Electric Glass Co. Ltd.

New Coaling and Water Softening Plants, Southern Railway.—New mechanical coaling and water softening plants have just been completed at Stewarts Lane, Battersea, depot. The coaling plant has a capacity of 150 tons and is of the type in which wagons of coal are hoisted to the receiving bin and there emptied by being axially rotated. Mechanically controlled chutes allow the coal to pass directly from the bin to the locomotive tenders as they pass below. In the water softening plant, 20,000 gal. of water can be treated and fed to engines in an hour. The Southern Railway has now installed five mechanical coaling and six modern water softening plants in the last few years. The latter are:—

At	Capacity (gal. p. hr.)
Nine Elms	16,000
Hither Green	5,000
Stewarts Lane	20,000
Eastleigh	20,000
Dover	10,000
Ramsgate	10,000

To ensure adequate supply to the Nine Elms plant, a well 500 ft. deep had to be sunk.

Railway Shopmen's Wages.—The National Railway Shopmen's Council has agreed that the deduction of 4⅛ per cent. from the earnings of railway shopmen shall be replaced by the following arrangements:—(1) As from the first full pay following October 1, 1934, the gross earnings of all railway employees under shop conditions (other than those engaged on the Great Central Section of the London & North Eastern Railway or on the Cheshire Lines) shall be subject to a deduction of 3½ per cent.; (2) as from the first full pay following January 1, 1935, all earnings shall be subject to a deduction of 2½ per cent.; (3) the deductions shall not operate so as to reduce the earnings of any adult male employee below 40s. a week. The railway companies undertake that short time shall not be worked so as to restrict employment to less than the equivalent of five full days in any week, apart from holiday periods or circumstances of an exceptional character.

CONTRACTS AND TENDERS

New Locomotives for China

Sir W. G. Armstrong Whitworth & Co. (Engineers) Ltd. has received an order from the Chinese Government Purchasing Commission, on behalf of the Ministry of Railways, China, for four 0-8-0 type tender locomotives for shunting service on the Canton Hankow Railway. These locomotives are to be constructed under the inspection of the consulting engineers, Messrs. Sandberg.

Beyer, Peacock & Co. Ltd. has received an order for four pairs of cast iron cylinders for locomotives for the Central Argentine Railway.

The English Steel Corporation has received an order from the Bengal-Nagpur Railway for 300 carriage and wagon axles.

Brown Bayley's Steel Works Limited has received an order from the Bengal-Nagpur Railway for 2,550 carriage and wagon tyres.

The Birmingham Railway Carriage & Wagon Co. Ltd. and Hurst, Nelson & Co. Ltd. have each received an order for 50 12-ton coal wagons from Charrington, Gardner, Locket & Co. Ltd.

The Agent, Great Indian Peninsular Railway, Victoria Terminus, Bombay invites tenders receivable on October 24, as follow:—Tender No. 1934/25 for the supply of 330 cast steel locomotive axleboxes; tender No. 1934/23 for the supply of connecting rods for D/5 type engines; and tender No. 1934/26 for the supply of 29 electric head-light generators for locomotives.

The Egyptian State Railways Administration has recently placed the following orders:—

Hurst Nelson & Co. Ltd.: Bogie frames, total cost £588 delivered f.o.b. Glasgow. (Ref. No. E.S.R. 21.188.)

Pirelli Limited: Cables, total cost £589 13s. 7d. delivered f.o.b. Southampton. (Ref. No. E.S.R. 30.89.)

N.V. Montan Export, Holland: Engine and tender tyres, total cost £1,670 2s. 6d. delivered f.o.b. Trieste or Hamburg. (Ref. No. E.S.R. 21.188.)

Uddeholms Aktiebolgt, Sweden: Boiler tubes, total cost £7,418 delivered free Port Said. (Ref. No. E.S.R. 317G.3/2.)

The Whitecross Co. Ltd.: Signalling materials, total cost £235 12s. 6d. delivered f.o.b. Liverpool-Birkenhead (Ref. No. E.S.R. 24.59, items 5 and 40.)

Thos. Cook & Son, Sté Belge des Lampes, and Associated Industries Limited: Electric lamps. (Ref. No. E.S.R. 329G. 3/2.)

Samuel Osborn & Co. Ltd.: Twist drills, total cost £539 f.o.b. English ports. (Ref. No. E.S.R. 308G. 3/2.)

The Superheater Co. Ltd.: Superheater elements.

Buck & Hickman Limited: Rotary cutters and special vices.

Consolidated Pneumatic Tool Co. Ltd.: Pneumatic hammers.

Stanton Ironworks Co. Ltd.: Cast-iron pipes and bends.

Reavell & Co. Ltd.: Piston rings.

A. Balfour & Co. Ltd.: High-speed steels and taps.

General Electric Co. Ltd.: Sleeves.

G. Turton Platt & Co. Ltd.: Buffers.

It is announced in our American contemporary, the *Railway Age*, that the Chilean State Railways is enquiring

for ten 4-8-4 type locomotives, the National Railways of Mexico Administration is to buy 1,000 40-ton box cars, and the Valve Pilot Corporation has received an order from the Lima Locomotive Works Inc. for five locomotive valve pilots for application to five 4-6-2 locomotives which that company is building for the Boston and Maine Railroad.

Forthcoming Events

Oct. 8 (*Mon.*).—Institute of Transport (London), at Inst. of Electrical Engineers, Savoy Place, W.C.2, 5.30 p.m. Presidential Address by Mr. Sidney E. Garcke.

Oct. 8 & 9 (*Mon. and Tues.*).—L.M.S.R. (London) Amateur Dramatic Society, at the Cripplegate Institute Theatre, Golden Lane, E.C., at 8 p.m. "The Farmer's Wife," by Eden Phillpotts.

Oct. 10 (*Wed.*).—Institution of Railway Signal Engineers, at Inst. of Electrical Engineers, Savoy Place, London, W.C.2, 6 p.m. "The Distant Signal Problem," by Mr. T. S. Lascelles.

Permanent Way Institution (London), in Staff Dining Room, Waterloo Station, 7 p.m. "Problems of Permanent Way Maintenance on Electrified Track," by Mr. J. E. Taylor.

Permanent Way Institution (Manchester-Liverpool), at Temperance Inst., Southport, 3 p.m. "Renewal of Steel Underbridges," by Mr. A. Curry.

Oct. 11 (*Thurs.*).—Institution of Locomotive Engineers (London), at Inst. of Mechanical Engineers, Storey's Gate, S.W.1, 6 p.m. Informal Meeting.

Southern Railway (London) Lecture and Debating Society, at Chapter House, St. Thomas' Street, London Bridge, S.E.1, 5.45 p.m. "The Kenya and Uganda Railways," by Mr. A. B. Cameron.

Institute of Metals (London), at Society of Motor Manufacturers, 83, Pall Mall, S.W.1, 7.30 p.m. Address by Chairman, Mr. C. J. Smithells.

Oct. 12 (*Fri.*).—Railway Club, 57, Fetter Lane, London, E.C.4, 7.30 p.m. "Punch's Railway (The West London Railway)," by Mr. D. V. Levien.

Federation of Railway Lecture and Debating Societies (N.E. Area), at Railway Inst., Queen Street, York, 7 p.m. "Some Aspects of Education," by Mr. Wm. Whitelaw.

Oct. 13 (*Sat.*).—Institute of British Foundrymen (Scottish), at Royal Technical College, George Street, Glasgow, 4 p.m. "The Position of the Designer and Patternmaker in Relation to Foundry Practice and Competitive Methods of Producing Castings," by Mr. A. L. Mortimer.

Oct. 19 (*Fri.*).—Institution of Mechanical Engineers. Annual Dinner.

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 39th Week			Totals to Date		
	1934	1933	Inc. or Dec.	1934	1933	Inc. or Dec.
	£	£	£	£	£	£
L.M.S.R. (6,941½ mls.)						
Passenger-train traffic	494,000	488,000	+ 6,000	19,124,000	18,828,000	+ 296,000
Merchandise, &c.	455,000	441,000	+ 14,000	17,181,000	15,921,000	+ 1,260,000
Coal and coke	236,000	222,000	+ 14,000	8,701,000	8,293,000	+ 408,000
Goods-train traffic	691,000	663,000	+ 28,000	25,882,000	24,214,000	+ 1,668,000
Total receipts	1,185,000	1,151,000	+ 34,000	45,006,000	43,042,000	+ 1,964,000
L.N.E.R. (6,339 mls.)						
Passenger-train traffic	324,000	318,000	+ 6,000	12,350,000	12,139,000	+ 211,000
Merchandise, &c.	373,000	331,000	+ 42,000	11,959,000	11,041,000	+ 918,000
Coal and coke	254,000	224,000	+ 30,000	8,767,000	7,997,000	+ 770,000
Goods-train traffic	627,000	555,000	+ 72,000	20,726,000	19,038,000	+ 1,688,000
Total receipts	951,000	873,000	+ 78,000	33,076,000	31,177,000	+ 1,899,000
G.W.R. (3,750 mls.)						
Passenger train traffic	210,000	202,000	+ 8,000	8,115,000	8,123,000	- 8,000
Merchandise, &c.	188,000	189,000	- 1,000	6,930,000	6,474,000	+ 456,000
Coal and coke	111,000	96,000	+ 15,000	3,849,000	3,754,000	+ 95,000
Goods-train traffic	299,000	285,000	+ 14,000	10,779,000	10,228,000	+ 551,000
Total receipts	509,000	487,000	+ 22,000	18,894,000	18,351,000	+ 543,000
S.R. (2,176 mls.)						
Passenger-train traffic	301,000	288,000	+ 13,000	11,729,000	11,553,000	+ 176,000
Merchandise, &c.	76,500	78,000	- 1,500	2,473,500	2,368,500	+ 105,000
Coal and coke	37,500	34,000	+ 3,500	1,205,500	1,133,500	+ 72,000
Goods-train traffic	114,000	112,000	+ 2,000	3,679,000	3,502,000	+ 177,000
Total receipts	415,000	400,000	+ 15,000	15,408,000	15,055,000	+ 353,000
Liverpool Overhead (6½ mls.)	1,039	1,080	- 41	44,941	44,468	+ 473
Mersey (4½ mls.)	3,756	3,945	- 189	157,928	154,295	+ 3,633
*London Passenger Transport Board	542,300	534,700	+ 7,600	6,851,500	6,779,000	+ 72,500
IRELAND						
Belfast & C.D. (80 mls.) pass.	2,311	2,290	+ 21	103,022	104,873	- 1,851
" " goods	527	496	+ 31	19,850	20,121	- 271
" " total	2,838	2,786	+ 52	122,872	124,994	- 2,122
Great Northern (562 mls.) pass.	10,500	10,900	- 400	399,000	304,600	+ 94,400
" " goods	9,450	10,250	- 800	323,950	251,150	+ 72,800
" " total	19,950	21,150	- 1,200	722,950	555,750	+ 167,200
Great Southern (2,158 mls.) pass.	25,532	26,679	- 1,147	960,948	952,604	+ 8,344
" " goods	35,178	33,417	+ 1,761	1,243,814	1,165,167	+ 78,647
" " total	60,710	60,096	+ 614	2,204,762	2,117,771	+ 86,991

* 13th Week, the receipts for which include those undertakings not absorbed by the L.P.T.B. in the corresponding period last year; last year's figures are, however, adjusted for comparative purposes

British and Irish Railways Stocks and Shares

Stocks	Highest 1933	Lowest 1933	Prices Oct. 3, 1934	Prices Rise/Fall
G.W.R.				
Cons. Ord.	55½	31	54½	+3½
5% Con. Prefce.	109¾	69½	112½	—
5% Red.Pref.(1950)	109¼	87½	109½	—
4% Deb.	108 13/16	99¼	109½	—
4½% Deb.	108	100¾	111½	—
4½% Deb.	116	106	119½	—
5% Deb.	128	117¼	130	—
2½% Deb.	65	60	70½	—
5% Rt. Charge	124	111½	128½	—
5% Cons. Guar.	122	103	126	—
L.M.S.R.				
Ord.	29⅞	12⅛	23½	+1
4% Prefce. (1923)	51	17	53	+2½
4% Prefce.	72	33¼	80½	+1½
5% Red. Prf. (1955)	93	47¼	100½	+1
4% Deb.	103¾	89½	104½	—
5% Red.Deb.(1952)	114	105	114½	—
4% Guar.	97¼	68⅝	101	—
L.N.E.R.				
5% Pref. Ord.	22½	7¾	18	+1¼
Def. Ord.	10¾	4⅛	8¾	+⅜
4% First Prefce.	65½	19⅜	68½	+3½
4% Second Prefce.	40½	12¼	34½	+2½
5% Red.Pref.(1955)	83¾	27	86½	+2
4% First Guar.	94⅝	58¼	96½	+1
4% Second Guar.	89¼	48	90½	+1
3% Deb.	77	60¼	78½	+1
4% Deb.	102¾	80	103	—
5% Red.Deb.(1947)	112	102½	111*	—
4½% Sinking Fund Red. Deb.	107½	98¾	108½	—
SOUTHERN				
Pref. Ord.	71	27¾	75	+1
Def. Ord.	24⅝	9⅝	23½	+½
5% Prefce.	107 11/16	74	112	—
5% Red.Pref.(1964)	107¾	78⅞	111½	—
5% Guar. Prefce.	124¼	102¾	125½	—
5% Red.Guar.Pref. (1957)	115⅝	103½	115	—
4% Deb.	107½	96¾	109	—
5% Deb.	126½	114¼	129½	—
4% Red. Deb. 1962–67	107¼	100	109½	—
BELFAST & C.D.				
Ord.	6		5	—
FORTH BRIDGE				
4% Deb.	99½	95½	102½	—
4% Guar.	98½	94	102½	—
G. NORTHERN (IRELAND)				
Ord.	7½	3½	7	—
G. SOUTHERN (IRELAND)				
Ord.	28	16	14	—
Prefce.	24	12⅛	16½	—
Guar.	42	16¾	46	—
Deb.	60	30⅞	60	-3
L.P.T.B.				
4½% "A"	117⅞	112	121½	—
5% "A"	127¼	119¼	131½	—
4½% "T.F.A."	111¼	106	111½	+1
5% "B"	122½	114	126	—
"C"	86¾	74½	84	+2
MERSEY				
Ord.	16¼	5	11	—
4% Perp. Deb.	83	63⅞	86½	—
3% Perp. Deb.	62	51	64½	—
3% Perp. Prefce.	50⅜	27	47½	—

* ex dividend

LEGAL AND OFFICIAL NOTICES

IN THE COURT OF THE RAILWAY RATES TRIBUNAL.

Road and Rail Traffic Act, 1933. Agreed Charges

NOTICE IS HEREBY GIVEN that Applications for the approval of Agreed Charges under the provisions of Section 37 of the Road and Rail Traffic Act, 1933, short particulars of which are set out in the Schedule hereto, have been lodged with the Railway Rates Tribunal.

The said Applications may be inspected at the Office of the Tribunal, 2, Clement's Inn, Strand, London, W.C.2, at any time during office hours and at the following places :—

LONDON : Railway Clearing House, 123, Seymour Street, N.W.1.
BIRMINGHAM : District Goods Manager's Office, Snow Hill, Great Western Railway.
CARDIFF : Divisional Superintendent's Office, Great Western Railway.
EXETER : Western Divisional Superintendent's Office, Southern Railway.
LEEDS : District Goods Manager's Office, Wellington Street, London & North Eastern Railway.
LEICESTER : District Goods and Passenger Manager's Office, London Midland & Scottish Railway.
MANCHESTER : District Goods Manager's Office, Hunt's Bank, London Midland and Scottish Railway.
SOUTHAMPTON : Southern Divisional Superintendent's Office, Southampton West, Southern Railway.
YORK : Goods Manager's Office, London & North Eastern Railway.
ABERDEEN : District Goods and Passenger Manager's Office, London Midland & Scottish Railway.
EDINBURGH : District Goods and Passenger Manager's Office, Waverley Station, London & North Eastern Railway.
GLASGOW : Commercial Manager's Office, Central Station, London Midland & Scottish Railway.

A copy of each Application lodged with the Tribunal can be obtained from Mr. G. Cole Deacon, Secretary, Rates and Charges Committee, 35, Parliament Street, Westminster, London, S.W.1, price 1s., post free.

Notices of objection by any parties entitled to object to the approval of any of the said Agreed Charges must state concisely the grounds of objection and must be filed at the office of the Registrar, 2, Clement's Inn, Strand, London, W.C.2, on or before the 23rd day of October, 1934, and a copy thereof on or before the same day served on or sent by registered post to Mr. G. Cole Deacon, at the above address. A separate Notice must be filed and served in respect of each Application.

Each Notice filed must be on foolscap-size paper and must be stamped with an adhesive fee stamp for 2s. 6d. (which can be purchased at the office of the Tribunal only). If sent by post for filing each Notice must be accompanied by a Postal Order for 2s. 6d. payable to the Registrar, when a stamp will be affixed at the office. A Notice by a Representative Body of Traders must contain a statement of the facts upon which such Body claims to represent a substantial number of traders interested in, or likely to be affected by the decision on, the application.

Four additional copies of each Notice must be lodged with the original at the office of the Registrar.

T. J. D. ATKINSON,
Registrar.

1st October, 1934.

Number of Application and Date of Lodgment.	Parties to Agreement.	Nature of Agreed Charge.
1934, No. 135—Sept. 28, 1934	SAVOY CAFE (BLACKPOOL) LIMITED, trading as Herbert Monk, Blackpool, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos. This application, by leave granted under Rule 4, relates also to Agreed Charges with other Registered Bacon Curers in Great Britain as specified therein	Per pig. Live pigs consigned to Registered Bacon Curers or their Agents.
1934, No. 136—Sept. 28, 1934	THE CITY AND PROVINCIAL STORES, Manchester, and the Cheshire Lines Committee, G.W., L. & N.E. and L.M. & S. Railway Cos.	Per package. Furniture and Household Requisites.
1934, No. 137—Sept. 28, 1934	CLEEVES LIMITED, Clapham, London, and the G.W., L. & N.E., L.M. & S., and Southern Railway Cos.	Per ton. Confectionery.
1934, No. 138—Sept. 28, 1934	WM. COLLINS, SONS & CO. LTD., Glasgow, and the L. & N.E. and L.M. & S. Railway Cos.	Per ton. Books, Magazines, Papers, daily and weekly, Periodicals, Stationery.
1934, No. 139—Sept. 28, 1934	THE CO-OPERATIVE WHOLESALE SOCIETY, LIMITED, Manchester, and the Midland and Great Northern Joint Committee and the L. & N.E. Railway Co.	Per ton. Preserves; Cheese in cartons; Potato Crisps; Cooked Meat; Sausages; Meat Pies; Advertising Matter.
1934, No. 140—Sept. 28, 1934	THE DISTRIBUTORS AND TRANSPORTERS LIMITED (Messrs. Unilever's Distributing Organisation), Blackfriars, London, and the G.W., and L.M. & S. Railway Cos.	Per ton. Candles, Soap and Soap with articles for advertisement.
1934, No. 141—Sept. 28, 1934	THE NATURAL FOOD CO., LTD., Cambridge Road, London, and the G.W., L. & N.E., L.M. & S., and Southern Railway Cos.	Per ton. Groceries articles, such as in Lists G and H; Advertising Matter; Empties returned to Suppliers.
1934, No. 142—Sept. 28, 1934	PIRIE APPLETON & CO. LTD., Mansell Street, London, and the L. & N.E. and L.M. & S. Railway Cos.	Per ton. Paper and Stationery, and Empties returned to Suppliers.
1934, No. 143—Sept. 28, 1934	SELFRIDGE & CO. LTD., Oxford Street, London, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos.	Per ton. Clothing, Drapery and General Stores Wares.
1934, No. 144—Sept. 28, 1934	TAYLOR, LAW & CO. LTD., Birmingham, and the G.W. and L.M. & S. Railway Cos.	Per ton. Tinware and Hardware.
1934, No. 145—Sept. 28, 1934	THE WITCHAMPTON BY-PRODUCTS LIMITED, Weybridge, and the Southern Railway Co.	Per ton. Firelighters.
1934, No. 146—Sept. 28, 1934	CARRICK'S (CATERERS) LIMITED, Low Row, near Carlisle, and the L. & N.E. Railway Co.	Per package. Cake, Cream in bottles, Pies and Sausages.
1934, No. 147—Sept. 28, 1934	THE DUCHESS OF DEVONSHIRE DAIRY CO. LTD., Tiverton, and the G.W. Railway Co.	Per ton. Butter, Cream, Eggs, Cheese, Paste and Advertising Matter.
1934, No. 148—Sept. 28, 1934	HORNE BROTHERS LIMITED, Oxford Street, London, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos.	Per package. Boots, Clothing, Hats, Hosiery and Shirts.
1934, No. 149—Sept. 28, 1934	F. G. HORNER, Wortley, Leeds, and the L. & N.E. and L.M. & S. Railway Cos.	Per package. Clothing, Drapery and General Stores Wares.
1934, No. 150—Sept. 28, 1934	R. J. & A. R. PITCHERS, Godalming, and the Southern Railway Co.	Per package. Woollen Goods.
1934, No. 151—Sept. 28, 1934	WOLSEY LIMITED, Leicester, and the L. & N.E. and L.M. & S. Railway Cos.	Per package. Hosiery and Advertising Matter.
1934, No. 152—Oct. 1, 1934	D. JONES, DICKINSON & CO. LTD., Dowlais, South Wales, and the G.W., and L.M. & S. Railway Cos.	Per package. Cake.
1934, No. 153—Oct. 1, 1934	NEWTON, CHAMBERS & CO. LTD., Thorncliffe, near Sheffield, and the L. & N.E. and L.M. & S. Railway Cos.	Per package. "Izal" Toilet Rolls.

South Indian Railway Company Limited

THE Directors are prepared to receive Tenders for the supply of :

PRESSED STEEL SLEEPERS AND KEYS (Metre Gauge).

Specifications and Forms of Tender will be available at the Company's Offices, 91, Petty France, Westminster, S.W.1.

Tenders, addressed to the Chairman and Directors of the South Indian Railway Co. Ltd., marked "Tender for Pressed Steel Sleepers," with the name of the firm tendering, must be left with the undersigned not later than 12 Noon on Monday, the 15th October, 1934.

The Directors do not bind themselves to accept the lowest or any Tender.

A charge, which will not be returned, will be made of £1 for each copy of the Specification.

Copies of the drawings may be obtained at the Offices of the Company's Consulting Engineers, Messrs. Robert White & Partners, 3, Victoria Street, S.W.1.

A. MUIRHEAD,
Managing Director.

91, Petty France,
Westminster, S.W.1.
28th September, 1934.

South Indian Railway Company Limited

THE Directors are prepared to receive Tenders for the supply of :—

1.—SOLID DRAWN STEEL BOILER TUBES.
2.—STEEL AXLES FOR CARRIAGES.
3.—FISHBOLTS AND NUTS.
4.—COPPER RODS, BRASS RODS AND SHEETS, &c.

Specifications and Forms of Tender will be available at the Company's Offices, 91, Petty France, Westminster, S.W.1.

Tenders, addressed to the Chairman and Directors of the South Indian Railway Co. Ltd., marked "Tender for Solid Drawn Steel Boiler Tubes," or as the case may be, with the name of the firm tendering, must be left with the undersigned not later than 12 noon on Friday, the 12th October, 1934, in respect of Specifications Nos. 1, 2 and 3, and not later than 10 a.m. on Friday, the 19th October, 1934, in respect of Specification No. 4.

The Directors do not bind themselves to accept the lowest or any Tender.

A charge, which will not be returned, will be made of 10s. for each copy of Specification No. 1, and 5s. for each copy of Specifications Nos. 2, 3 and 4.

Copies of the Drawings may be obtained at the Offices of the Company's Consulting Engineers, Messrs. Robert White & Partners, 3, Victoria Street, S.W.1.

A. MUIRHEAD,
Managing Director.

91, Petty France,
Westminster, S.W.1.
3rd October, 1934.

THE MADRAS & SOUTHERN MAHRATTA RAILWAY CO. LTD. invite Tenders for :—

270,000 DOG SPIKES—METRE GAUGE.

Specification and Form of Tender can be obtained at the Company's Offices, 25, Buckingham Palace Road, London, S.W.1.

Fee HALF-A-GUINEA, *which will not be returned.*

Tenders must be submitted not later than 2 o'clock p.m. on Tuesday, 16th October, 1934.

The Directors do not bind themselves to accept the lowest or any Tender and reserve to themselves the right of reducing or dividing the order.

By Order of the Board,
C. L. MAGNIAC,
Secretary.

PATENTS for Inventions, Trade Marks, Advice, Handbook, and consultations free. King's Patent Agency, Ltd. (B. T. King, C.I.M.E., Registered Patent Agent, G.B., U.S., and Canada), 146A, Queen Victoria Street, London, E.C.4. 49 years' references. 'Phone City 6161.

Railway Share Market

There has again been a considerable amount of business in the stock and share markets, and home railway stocks have attracted additional attention. The business on Monday was mainly of a buying character, but later there was a more even tendency. On Tuesday there was not a single change in the day's prices on balance. The "matching" of buyers and sellers in out-of-the-way prior lien stocks reflects a resiliency which has been lacking in home railway stocks in recent years.

There is now a greater disposition for investors to consider the merits of the prior lien charge stocks, and as the income yield on several stocks is still fully 10s. per cent. more than can be secured on a British Government stock, the extremely small risk involved is compensated for very substantially. Great Western 4 per cent. debentures and Southern 4 per cent. debentures can be bought at the present time to yield £3 13s. 6d. per cent., whilst a limited amount of L.M.S. 4 per cent. debenture stock is on offer at 105½ to give a yield of £3 16s. 3d. per cent. A certain amount of L.N.E. 4 per cent. second guaranteed stock is also available just now at 90¾, at which the yield is £4 8s. 6d. per cent., although a prospective buyer would have to pay 103½ for the same company's 4 per cent. debenture stock, at which price the yield works out at £3 18s. per cent. The traffic prospects of the Southern Railway are still impressing investors favourably towards the preferred ordinary stock of the company. In other directions London Transport Passenger Board "C" stock came into request and reached a higher quotation on dividend prospects. In the foreign railway market there was less activity. Dealers reported little business in Argentine railway stocks, and there is a tendency for investors to await the issue of the accounts, and more particularly to do nothing until they have had an opportunity of hearing the views of the chairmen at the annual meetings of the companies. Brazilian stocks were inclined to harden under the influence of favourable reports of improvement in Brazilian business. Leopoldina ordinary stock was favoured and established a further advance.

An increase in inquiries was reported for some of the Mexican issues and International of Central America issues. Among Colonial railway stocks there was activity in Beira Railway certificates. These represent "parts" or shares of the company's assets, there being no capital in the usual acceptance of the term. These "parts" or shares are largely held by the Chartered (British South Africa) Company, who have issued certificates against them.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

	Railways	Miles open 1933-34	Week Ending	Traffics for Week: Total this year	Traffics for Week: Inc. or Dec. compared with 1933	No. of Week	Aggregate Traffics to Date: Totals: This Year	Aggregate Traffics to Date: Totals: Last Year	Aggregate Traffics to Date: Increase or Decrease	Shares or Stock	Prices: Highest 1933	Prices: Lowest 1933	Prices: Oct. 3, 1934	Prices: Yield % (See Note)
				£	£		£	£	£					
South & Central America.	Antofagasta (Chili) & Bolivia	830	30.9.34	16,440	+ 1,070	39	551,660	414,900	+ 136,760	Ord. Stk.	26	11 3/4	25	Nil
	Argentine North Eastern..	753	29.9.34	8,155	— 513	13	102,628	135,250	— 32,622	,,	14 1/2	5	9 1/2	Nil
	Argentine Transandine ..	111	—	—	—	—	—	—	—	A. Deb.	55	40	50	8
	Bolivar	170	Aug., 1934	5,300	+ 900	34	49,150	51,650	— 2,500	6 p.c. Db.	10	5	10	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds.	15	11	13	315 6
	Buenos Ayres & Pacific ..	2,806	29.9.34	66,959	— 17,827	13	905,424	1,080,909	— 175,485	Ord. Stk.	26	9 7/16	12 1/2	Nil
	Buenos Ayres Central ..	190	9.9.34	$151,100	+ $8,300	10	$1,354,900	$1,327,200	+ $27,700	Mt. Db.	30	10	23	Nil
	Buenos Ayres Gt. Southern	5,085	29.9.34	126,036	— 21,826	13	1,599,950	1,993,061	— 393,111	Ord. Stk.	44 1/2	21 1/2	29	Nil
	Buenos Ayres Western ..	1,926	29.9.34	40,864	— 13,741	13	539,386	675,185	— 135,799	,,	34 1/2	15 3/4	24	Nil
	Central Argentine ..	3,700	29.9.34	110,289	— 14,945	13	1,629,735	1,767,336	— 137,601	,,	28 1/2	15	18 1/2	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	18	10	10	Nil
	Cent. Uruguay of M. Video	273	29.9.34	16,306	+ 2,774	13	183,523	182,375	+ 1,148	Ord. Stk.	20	8	12 1/2	Nil
	Do. Eastern Extn.	311	29.9.34	2,861	+ 226	13	37,884	32,801	+ 5,083	—	—	—	—	—
	Do. Northern Extn.	185	29.9.34	2,238	+ 1,071	13	21,303	20,207	+ 1,096	—	—	—	—	—
	Do. Western Extn.	211	29.9.34	1,799	+ 383	13	16,773	17,227	— 454	—	—	—	—	—
	Cordoba Central	1,218	29.9.34	26,090	— 12,560	13	420,410	548,180	— 127,770	Ord. Inc.	9 1/4	2 1/2	5	Nil
	Costa Rica	188	July, 1934	18,181	— 2,523	4	18,181	20,704	— 2,523	Stk.	29	20	29	67/8
	Dorada	70	Aug., 1934	11,300	+ 2,800	34	80,500	61,600	+ 18,900	1 Mt. Db.	76 1/2	68 3/4	105	5 11/16
	Entre Rios	810	29.9.34	13,176	+ 553	13	144,411	178,987	— 34,576	Ord. Stk.	26 1/2	9	15	Nil
	Great Western of Brazil ..	1,082	29.9.34	10,500	+ 1,800	39	298,100	367,300	— 69,200	Ord. Sh.	23/6	1/2	7/8	Nil
	International of Cl. Amer.	794	Aug., 1934	$337,294	+ $41,455	34	$3,360,090	$3,285,984	+ $74,106	—	—	—	—	—
	Interoceanic of Mexico ..	—	—	—	—	—	—	—	—	1st Pref.	1/2	1/16	1/2	Nil
	La Guaira & Caracas ..	22 3/4	Sept., 1934	3,045	— 705	39	32,865	46,520	— 13,655	Stk.	16	10	8 1/2	Nil
	Leopoldina	1,918	29.9.34	29,142	+ 343	39	987,102	967,550	+ 19,552	Ord. Stk.	20 1/4	10	11	Nil
	Mexican	483	21.9.34	$185,800	+ $34,800	12	$2,610,000	$2,138,200	+ $471,800	,,	3	1/2	3	Nil
	Midland of Uruguay ..	319	Aug., 1934	8,088	— 697	9	17,549	17,530	+ 19	Ord. Stk.	2	1	1 1/2	Nil
	Nitrate	401	30.9.34	3,777	— 4,609	39	186,287	97,226	+ 89,061	Ord. Sh.	78/6	11/16	3/8	Nil
	Paraguay Central	274	29.9.34	5,350	+ 2,210	13	60,330	48,620	+ 11,710	Pr. Li. Stk.	72	49 1/2	70	8 1/2
	Peruvian Corporation ..	1,059	Aug., 1934	70,048	+ 14,087	8	122,665	107,206	+ 15,459	Pref.	15 1/4	5	11	Nil
	Salvador	100	22.9.34	¢8,630	— ¢2,370	12	¢115,607	¢164,410	— ¢48,803	Pr. Li. Db.	70	66 1/2	70	71/8
	San Paulo	1531/2	23.9.34	29,338	+ 410	38	1,146,333	1,146,301	+ 32	Ord. Stk.	102	68	82	4 7/8
	Taltal	164	Aug., 1934	6,435	+ 2,720	8	13,475	7,035	+ 6,440	Ord. Sh.	15/4	3/4	2	5
	United of Havana.. ..	1,365	29.9.34	16,111	+ 354	13	221,476	171,713	+ 49,763	Ord. Stk.	8	2	4 1/2	Nil
	Uruguay Northern ..	73	Aug., 1934	1,015	— 65	9	2,071	2,146	— 75	Deb. Stk.	6	3 1/2	6 1/2	Nil
Canada.	Canadian National ..	23,736	21.9.34	736,962	+ 87,653	37	23,497,942	20,757,090	+2,740,852	—	—	—	—	—
	Canadian Northern ..	—	—	—	—	—	—	—	—4 p.c.	Perp. Dbs.	60 1/2	38	75 1/2	5 5/16
	Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gar.	99 3/4	85	102	3 15/16
	Canadian Pacific	17,018	21.9.34	583,600	+ 35,800	37	17,493,800	15,675,800	+1,818,000	Ord. Stk.	22 1/8	11	14	Nil
India.†	Assam Bengal	1,312	1.9.34	23,595	+ 1,520	22	585,984	477,716	+ 108,268	Ord. Stk.	79	70	82 1/2	3 11/1
	Barsi Light..	202	8.9.34	1,695	— 150	23	68,782	67,845	+ 937	Ord. Sh.	10 1/4	70	97 1/2	6 1/8
	Bengal & North Western..	2,112	8.9.34	28,770•	— 10,248	23	1,112,265	1,114,741	— 2,476	Ord. Stk.	292	240	283 1/2	5 5/8
	Bengal Dooars & Extension	161	8.9.34	3,103	+ 206	23	62,974	62,880	+ 94	,,	127	119	126	5 9/16
	Bengal-Nagpur	3,269	1.9.34	86,550	— 9,147	22	2,456,623	2,225,419	+ 231,204	,,	97 1/4	83 1/2	103 1/2	3 7/8
	Bombay, Baroda & Cl. India	3,072	22.9.34	152,625	+ 26,400	25	3,714,450	3,543,450	+ 171,000	,,	112	107	110 1/2	5 7/16
	Madras & South'n Mahratta	3,230	8.9.34	101,775	+ 4,899	23	2,649,407	2,597,720	+ 51,687	,,	127	114 1/4	128 1/2	7
	Rohilkund & Kumaon ..	546	8.9.34	6,658	+ 630	23	215,304	209,976	+ 5,328	,,	260	225	251 1/2	5 15/16
	South India	2,526	8.9.34	83,749	+ 2,693	23	1,877,635	1,801,047	+ 76,588	,,	119 1/2	112	116 1/2	6 7/8
Various.	Beira-Umtali	204	July, 1934	62.234	+ 17.455	43	519,179	411,279	+ 107,900	—	—	—	—	—
	Bilbao River & Cantabrian	15	Aug., 1934	1,358	— 426	34	14,340	12,190	+ 2,150	—	—	—	—	—
	Egyptian Delta	621	20.9.34	7,151	+ 1,850	24	98,013	88,827	+ 9,186	Prf. Sh.	15 1/32	1 3/4	2 3/4	3 5/8
	Great Southern of Spain ..	104	22.9.34	3,154	+ 752	38	81,389	81,084	+ 305	Inc. Deb.	4	3	3 1/2	Nil
	Kenya & Uganda	1,625	Mar., 1934	240,520	+ 21,064	12	638,137	606,192	+ 31,945	—	—	—	—	—
	Manila	—	—	—	—	—	—	—	—	B. Deb.	53	33 1/2	45 1/2	7 11/16
	Mashonaland	913	July, 1934	116,483	+ 42,625	43	956,615	650,063	+ 306,552	1 Mg. Db.	91 5/4	42	94	5 5/16
	Midland of W. Australia ..	277	Aug., 1934	14,055	+ 137	8	25,952	25,857	+ 95	Inc. Deb.	89	70	97 1/2	4 1/2
	Nigerian	1,905	11.8.34	41,030	+ 8,852	19	499,536	431,151	+ 68,385	—	—	—	—	—
	Rhodesia	1,538	July, 1934	192,507	+ 58,885	43	1,612,748	1,187,812	+ 424,936	4 p.c. Db.	98 1/2	80 3/4	102	3 15
	South African	13,182	8.9.34	525,660	+ 82,211	23	11,397,760	10,033,096	+1,364,664	—	—	—	—	—
	Victorian	6,172	June, 1934	695,917	+ 61,400	52	9,175,111	9,446,121	— 271,010	—	—	—	—	—
	Zafra & Huelva	112	Aug., 1934	11,147	— 936	34	88,008	85,414	+ 2,594	—	—	—	—	—

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1/16.

• Traffic dislocated by floods. † Receipts are calculated @ 1s. 6d. to the rupee. § ex dividend. Salvador receipts are in currency.

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the sterling weekly receipts at the par rate of exchange has proved misleading, the amount being overestimated. The statements from July 1 onwards are based on the current rate of exchange and not on the par value

Yield % (See Note)
Nil
Nil
8
Nil
313 6
Nil
Nil
Nil
Nil
Nil
Nil
Nil
—
—
Nil
6 7/8
5 11/16
Nil
Nil
—
Nil
Nil
Nil
Nil
Nil
Nil
8 1/2
Nil
7 1/8
4 7/8
5
Nil
Nil
—
5 5/16
3 15/16
Nil
3 11/16
6 1/8
5 5/8
5 9/16
3 7/8
5 7/16
7
5 15/16
6 7/8
—
—
3 5/8
Nil
—
7 11/16
5 5/16
4 1/8
—
3 1/16
—
—
—
—